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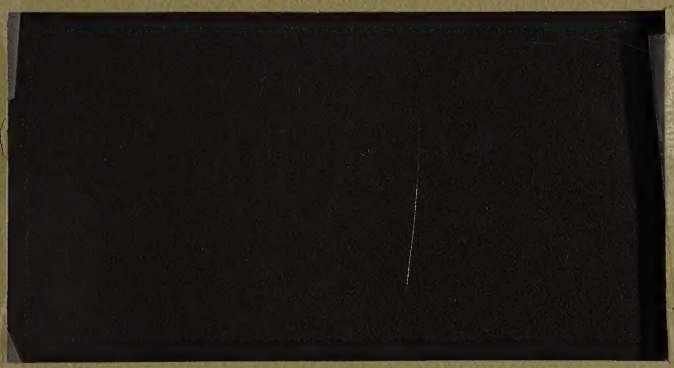

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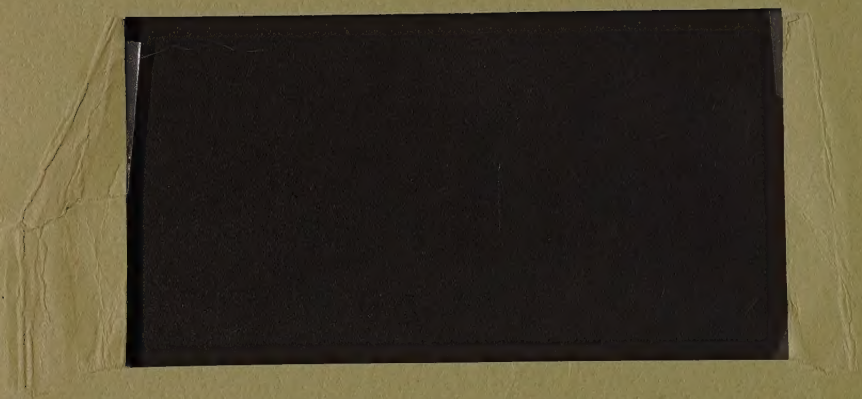

INSTRUCTION MANUAL

MODEL 750A

UHF–VHF
RF
SIGNAL GENERATOR

LogiMetrics, INC.
121-03 Dupont St.
Plainview, New York 11803

WARRANTY

All LogiMetrics products are warranted against defects in material and workmanship for a period of one year from date of purchase and, if properly used , will perform in full accordance with their applicable specifications

Any instrument that proves to be defective during the warranty period will be repaired or, at our option, replaced without charge. Equipment returns to our factory are to be prepaid.

No other warranty is expressed or implied. We are not liable for consequential damages.

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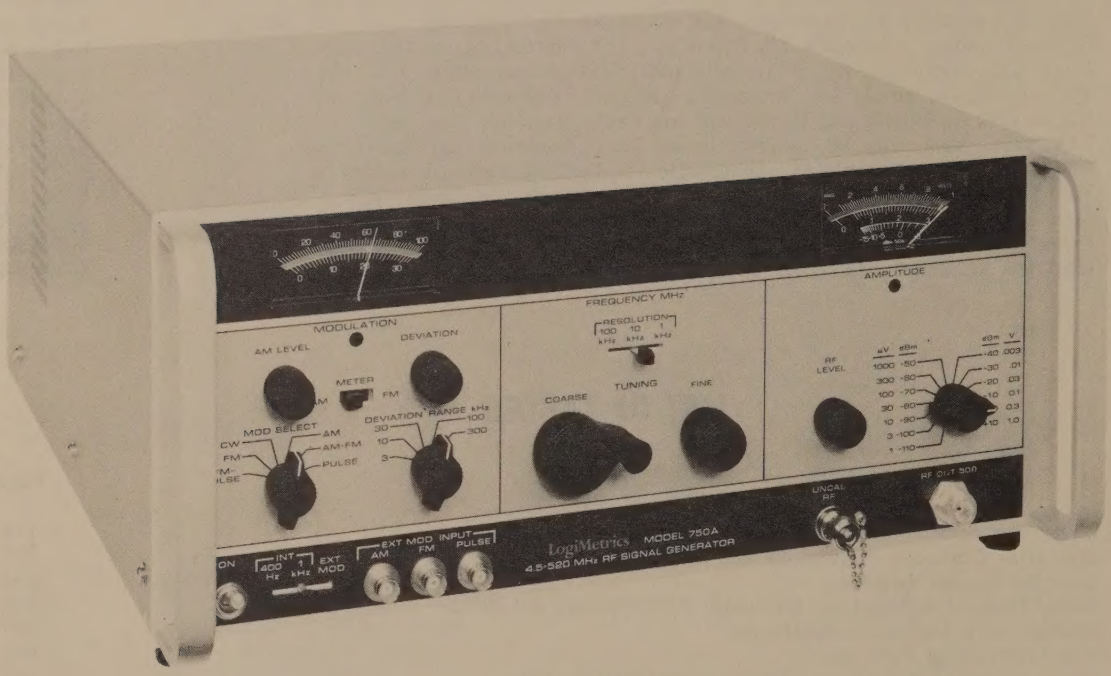


Figure 1-1. Model 750A RF Signal Generator

SECTION I
INTRODUCTION

1–1. SCOPE OF MANUAL

1-2. This manual contains instructions for the use of the RF Signal Generator, Model 750A, (Figure 1-1) manufactured by LogiMetrics, Inc., Greenvale, New York 11548. This manual includes a general description of the instrument, operating instructions and theory of operation.

1–3. PURPOSE AND USE OF THE EQUIPMENT

1-4. The Model 750A RF Signal Generator provides 1 volt RMS into a 50 ohm load over a frequency range of 4.5 to 520 MHz. The output frequency is displayed on a 5 digit display. The range of the calibrated attenuator is +13 dBm to -127 dBm. It provides AM, FM, PULSE, simultaneous AM-FM and simultaneous FM-PULSE modulation.

1-5. Typical uses of the Model 750A RF Signal Generator are making measurements of bandwidth, attenuation, alignment, frequency dial calibration, frequency rejection, sensitivity, power gain and other characteristics. It can also be used as a receiver local oscillator, a modulated transmitter or system reference in checkout equipment.

1–6. GENERAL DESCRIPTION

1-7. The RF Signal Generator, Model 750A, which hereafter will be referred to by model number, is a self-contained, compact instrument suitable for bench or rack use. This instrument is line-powered and consists of a panel, a chassis, and dust covers. The panel serves as a mounting for the controls, connectors and monitoring meters. The dust covers enclose and protect the internal components of the equipment. Kits to rack mount the instrument are optional

1–8. EQUIPMENT SPECIFICATIONS

1-9. Table 1-1 lists the equipment specifications for the Model 750A instrument.

TABLE 1-1. EQUIPMENT SPECIFICATIONS

Characteristic	Specification
FREQUENCY	
Range	Continuously tunable from 4.5 to 520 MHz.
Tuning	Mechanical tuning plus fine electronic tuning to provide ultra fine control of frequency.
Readout	5 digit LED display with variable resolution of 1, 10, or 100 kHz.
Accuracy	$\pm\frac{1}{2}$ the resolution plus the reference frequency accuracy. Internal reference frequency is typically less than 1 PPM at room temperature.
Stability	Typically 20 PPM +1 kHz per 10 minutes after warmup.
SPECTRAL PURITY	
Harmonics	At least 30 dB below carrier.
AM Hum & Noise Sidebands	At least 70 dB below the carrier
Residual FM	Less than 0.25 PPM +50 Hz RMS.
Incidental FM including Phase Mod with 30% AM	Less than 1 PPM +100 Hz.
Incidental AM with FM	Less than 1%.

TABLE 1-1. EQUIPMENT SPECIFICATIONS (Continued)

Characteristic	Specification
Spurious Signals	All non harmonic and non line related spurious greater than 60 dB below CW.
Broad Band Noise	Averaged RMS noise typically 140 dB below the carrier in a 1 Hz bandwidth with RF level set for full scale.
FM Noise	Averaged RMS noise typically 116 dB down in a 1 Hz bandwidth, 20 kHz away from the carrier
RF OUTPUT	
Level	Continuously adjustable from 0.1 uV (-127 dBm) to 1V RMS (+13 dBm) into 50 ohms resistive load.
Attenuator	120 dB with 10 dB per step, plus continuously variable 18 dB calibrated variable indicated on the meter.
Monitor	0 to 1V RMS, 0 to 0.3V RMS, and -15 to +3 dB referenced to 0 dB, 50 ohms.
Monitor Linearity	±2% of full scale.
Accuracy	±1 dB at +13 dBm plus 0.1 dB/10 dB setting of attenuator.
Leveling	Less than -0.5 dB variation with frequency.
Impedance	50 ohms, SWR less than 1.2 for levels below 0 dBm.
Connector	Type N.
Auxiliary RF Output	A fixed level cw signal of 100 mV RMS minimum is provided at front panel BNC connector.
MODULATION	AM, FM, Pulse - simultaneous AM-FM, Pulse-FM.
AMPLITUDE MODULATION	
Range	0 to 100%.
Meter Accuracy	±5% of full scale (20 Hz to 20 kHz)
Distortion	Less than 1% for 30% AM to 520 MHz, 3% for 70% AM to 500 MHz
Internal	400 and 1000 Hz (±5%).
External Frequency	DC to 20 kHz.
Level	3V RMS into 600 ohms.
FREQUENCY MODULATION	
Deviation	0 to 300 kHz peak.
DEVIATION METER: Ranges	0 to 3 kHz, 0 to 10 kHz, 0 to 30 kHz, 0 to 100 kHz, 0 to 300 kHz peak.
Accuracy	±5% of full scale (20 Hz to 100 kHz).

TABLE 1-1. EQUIPMENT SPECIFICATIONS (Continued)

Characteristic	Specification
Distortion	Less than 0.5% at 75 kHz deviation.
Internal	400 and 1000 Hz.
External Frequency	DC to 100 kHz.
External Level	3V RMS into 600 ohms.
EXTERNAL PULSE	
On to Off Ratio	40 dB minimum.
Pulse Width	0.1 usec minimum.
Pulse Rate	50 Hz to 50 kHz.
Level	+1V peak into 50 ohms.
Peak Pulse Amplitude	To be within 1 dB of CW level.
GENERAL	
Power	115/230V ±10%, 50 to 400 Hz, 75W.
Dimensions	7" H x 16-3/4" W x 18-3/8" D. Provisions for rack mounting (optional).
RFI and Leakage	Meets MIL-I-6181D. Less than 3 uV is induced in a 2 turn, 1 inch diameter loop 1 inch away from any surace measured into a 50 ohm receiver.
Weight	27 lbs.
Operating Temperature Range	0 to +55°C.

SECTION II
OPERATION

2–1. GENERAL

2-2. The instrument is shipped complete and ready to operate; no special or permanent installation procedures are required. The instrument should be unpacked upon receipt, observing the usual precautions customary when unpacking an electronic instrument.

2–3. INSTALLATION

2-4. After unpacking the instrument, plan its installation. The required space is shown in Figure 2-1. If the instrument is to be rack mounted, the rack mounting hardware must be installed. The instrument requires 115 or 230 volts, single phase, 50-400 Hz AC power.

Note

The instrument is shipped ready for 115 volt operation. If the instrument will be operated from a 230 volt source, set the 115/230 volt selector switch on the rear panel of the instrument to its 230 volt position. Replace the 1 AMP SLO-BLO fuse with a 1/2 AMP SLO-BLO fuse. Never replace this fuse with one of a larger value.

2-5. Connect the power cable of the instrument to an ac receptacle. If the ac receptacle is not a grounding type use an adaptor and connect the green lead to ground.

2–6. OPERATING PROCEDURES

2-7. The operating procedures for the Model 750A are described in paragraphs 2-8 through 2-16.

2-8. OPERATING CONTROLS, INDICATORS AND CONNECTORS. The operating controls, indicators and connectors of the instrument are located on its front and rear panels, and their functions are listed in table 2-1 and shown in figure 2-2.

2-9. CONNECTION AND PRELIMINARY OPERATION. To operate the instrument proceed as follows:

a. Connect instrument to device under test and external modulation source, if required. Be sure that the RF OUT 50 ohm output is terminated in a 50 ohm resistive load.

CAUTION

Do not connect an RF or DC power source to the RF OUT 50 ohm or UNCAL RF output connectors. Doing so may cause damage to the instrument.

b. Set the MOD SELECT control to its CW position.

c. Set the power switch to its ON position The FREQUENCY MHz display will illuminate and indicate the frequency being generated. Also the AMPLITUDE meter needle will move to the setting of the RF LEVEL control.

Note

For optimum operation the attenuator selector and RF LEVEL control settings should oe made such that meter readings in the range of 30 to 100 percent of full scale are obtained, except for meter readings below 0.3 uVolt. Therefore, when using the Model 750A it is advisable to use the highest output signal level possible and to reset the attenuator selector for major step changes.

2-10. CW MODE OPERATION. In the CW mode of operation the Model 750A delivers an unmodulated RF output signal whose frequency and level are determined by the settings of the operating controls. To operate in the CW mode proceed as follows:

a. Perform the turn-on procedure of paragraph 2-9.

b. Set the RESOLUTION selector to 10 kHz and adjust the TUNING COARSE and FINE controls to obtain the desired output frequency.

c. Set the attenuator selector to the desired output level range.

d. Set the RF LEVEL control to the desired output level as indicated on the AMPLITUDE meter.

e. Recheck the indications on the FREQUENCY MHz display and the AMPLITUDE meter, trim the instrument controls if necessary.

f. For higher resolution set RESOLUTION switch to 1 kHz. Tune the FINE control to the exact frequency of interest. For frequencies above 100 MHz using 1 kHz resolution the real first digit is not displayed and the over-range light will flash.

g. For lower resolution set RESOLUTION switch to 100 kHz. This will blank out the right hand digit.

2-11. OPERATION WITH INTERNAL AMPLITUDE MODULATION. In the internal AM mode of operation the output may be modulated by an internal 400 Hz or 1 kHz signal depending upon the setting of the modulation selector switch. The output frequency, level and depth (percentage) of modulation are determined by the settings of the operating controls. To operate with

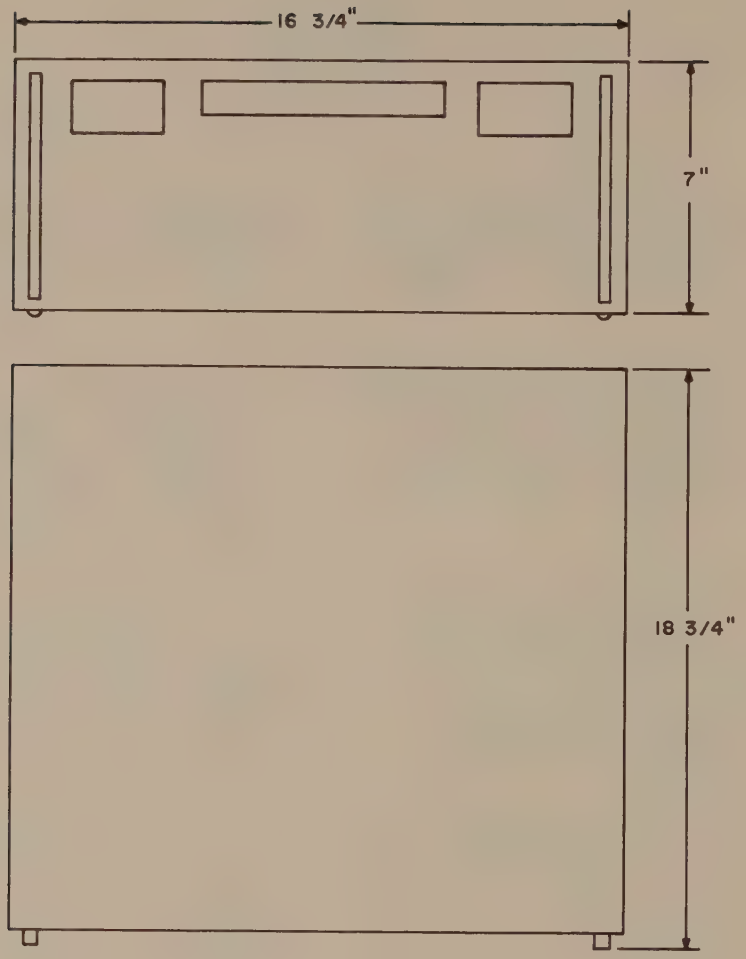


Figure 2-1. Outline Drawing

internal AM proceed as follows:

a. Perform the turn-on procedure of paragraph 2-9.

b. Set MOD SELECT to AM, and modulation selector to INT 400 Hz or 1 kHz position, whichever is desired.

c. Set the RESOLUTION switch to 10 kHz.

d. Tune the instrument to the desired frequency using the TUNING control for coarse adjustment and the FINE control for fine adjustment. Observe the frequency on the FREQUENCY MHz display while tuning.

e. Set the attenuator selector to the desired output level range.

f. Set the RF LEVEL control to the desired output level as indicated on the AMPLITUDE meter.

g. Adjust the AM LEVEL control until the desired percentage of modulation is indicated on the MODULATION meter.

h. Recheck the indications on the FREQUENCY MHz display, MODULATION meter and the AMPLITUDE meter, trim the instrument controls if necessary.

i. The selected 400 Hz or 1 kHz modulating signal

is also available at the front panel EXTERNAL MOD INPUT AM connector.

2-12. OPERATION WITH EXTERNAL AMPLITUDE MODULATION. In the external AM mode of operation the output may be modulated by an external modulation signal of DC to 20 kHz. To operate with external modulation proceed as follows:

a. Perform the procedure of paragraph 2-11, except set the modulation selector to its EXT MOD position and connect an external modulation generator, with an output amplitude of 3 volts RMS, to the front panel EXT MOD INPUT AM connector.

2-13. OPERATION WITH INTERNAL FREQUENCY MODULATION. In the internal FM mode of operation, the output may be modulated by an internal 400 Hz or 1 kHz signal depending on the setting of the selector switch. The output frequency, level and deviation are determined by the settings of the operating controls. To operate with internal FM proceed as follows:

a. Perform the turn-on procedure of paragraph 2-9.

b. Set MOD SELECT to FM and modulation selector to INT 400 Hz or 1 kHz position, whichever is desired.

c. Set the RESOLUTION switch to 10 kHz.

d. Tune the instrument to the desired frequency using the TUNING control for coarse adjustment and FINE control for fine adjustment. Observe the frequency on the FREQUENCY MHz display while tuning.

e. Set the attenuator selector to the desired output level range.

f. Set the RF LEVEL control to the desired output level as indicated on the AMPLITUDE meter.

g. Set the DEVIATION RANGE kHz switch to the desired range and adjust the DEVIATION control until the desired deviation is indicated on the MODULATION meter.

h. Recheck the indications on the FREQUENCY MHz display, MODULATION meter and AMPLITUDE meter. Trim the instrument controls if necessary.

i. The selected 400 Hz or 1 kHz modulating signal is also available at the front panel EXTERNAL MOD INPUT AM connector.

2-14. OPERATION WITH EXTERNAL FREQUENCY MODULATION. In the external FM mode of operation, the output may be modulated by an external modulation signal of DC to 100 kHz. To operate with external modulation proceed as follows:

a. Perform the procedure of paragraph 2-13 except set the modulation selector to its EXT MOD position and connect an external modulation generator, with an output amplitude of 3 volts RMS, to the front panel EXT MOD INPUT FM connector.

2-15. OPERATION WITH EXTERNAL PULSE MODULATION. In the external pulse mode of operation, the output may be modulated by an external pulse with a minimum width of 0.1 usec, a rate of 50 to 50,000 pulses per second. To operate with external pulse modulation proceed as follows:

a. Perform the turn-on procedure of paragraph 2-9.

b. Set the MOD SELECT to PULSE, and connect an external pulse generator with a minimum level of +1V into 50 ohms to the EXT MOD INPUT PULSE connector.

c. Set the RESOLUTION switch to 10 kHz.

d. Tune the instrument to the desired frequency using the TUNING control for coarse adjustment and the FINE control for fine adjustment. Observe the frequency on the FREQUENCY MHz display while tuning.

e. Set the attenuator selector to the desired output level range.

f. Set the RF LEVEL control to the desired output level as indicated on the AMPLITUDE meter.

g. Adjust the external pulse generator for the desired pulse width and rate.

2-16. OPERATION WITH SIMULTANEOUS AM-FM. In the simultaneous AM-FM mode of operation, its output may be simultaneously amplitude and frequency modulated. Both modulations must be eitner internal or external not a combination. To operate in internal mode proceed as follows:

a. Perform the turn-on procedure of paragraph 2-9.

b. Set the MOD SELECT to AM-FM and modulation selector to INT 400 Hz or 1 kHz position, whichever is desired.

c. Set RESOLUTION switch to 10 kHz.

d. Tune the instrument to the desired frequency using the TUNING control for coarse adjustment and FINE control for fine adjustment. Observe the frequency on the FREQUENCY MHz display while tuning.

e. Set the attenuator selector to the desired output level range.

f. Set the RF LEVEL control to the desired output level as indicated on the AMPLITUDE meter.

g. Set the METER switch to AM.

h. Adjust the AM LEVEL control until the desired percentage of modulation is indicated on the MODULATION meter.

i. Set the METER switch to FM.

j. Set the DEVIATION RANGE kHz switch to the desired range and adjust the DEVIATION control until the desired deviation is indicated on the MODULATION meter.

k. Recheck the indications on the FREQUENCY MHz display, MODULATION meter and AMPLITUDE meter. Trim the instrument controls if necessary.

l. The selected 400 Hz or 1 kHz modulating signal is also available at the front panel EXTERNAL MOD INPUT AM connector.

2-17. OPERATION WITH SIMULTANEOUS AM-FM, EXTERNAL. In the external AM-FM external mode of operation, the output may be AM by an external modulation signal of DC to 20 kHz and FM by an external modulation signal of DC to 100 kHz. To operate in this mode proceed as follows:

a. Perform the procedure of paragraph 2-16 except set the modulation selector to its EXT MOD position and connect external modulation generators with an output amplitude of 3 volts RMS, to the front panel EXT MOD INPUT AM and FM connectors.

2-18. OPERATION WITH SIMULTANEOUS FM-PULSE. In the simultaneous FM-PULSE mode of operation the output may be simultaneously pulse and frequency modulated. The FM may be either internal or external while the pulse is external. To operate in this mode proceed as follows:

a. Set the MOD SELECT to FM-PULSE. For internal FM perform the procedure of paragraph 2-13 or 2-14 for external FM. Then perform the procedure of paragraph 2-15 for external pulse modulation.

2-19. UNCALIBRATED RF SIGNAL OPERATION. The uncalibrated RF output signal is a fixed-level CW signal with a nominal amplitude of 100 millivolt RMS and it appears at the front panel UNCAL RF connector. If the uncalibrated RF signal is desired for test or other purposes, connect a BNC coaxial cable to the UNCAL RF connector.

2-20. PACKAGING INSTRUCTIONS

2-21. PACKAGING FOR SHORT-TERM STORAGE. If the instrument is to be stored for a relatively short period, cover it with a suitable protective covering, such as a sheet of plastic or paper. Put the accessories and instruction manual in an envelope or bag and fasten it to the instrument to prevent loss. Store the instrument in a clean and dry area where it will not be subjected to extreme temperatures.

2-22. PACKAGING FOR LONG-TERM STORAGE OR SHIPMENT. If the instrument is to be stored for a long time or shipped, proceed as follows:

a. If the original wrappings and carton have been saved, repackage the instrument in them.

b. If new packing materials are to be used, assemble the necessary wrappings and carton.

c. Wrap the instrument in a moisture-and-vapor-proof barrier such as plastic or waterproof paper.

d. Wrap the accessories and instruction manual in a moisture-and-vapor-proof barrier.

e. Place the packages in a suitable carton. Fill all voids in the carton with suitable packing to prevent the packages from shifting in the carton.

f. Seal and mark the carton.

g. If the storage or shipping conditions make it necessary, enclose the carton within an outer carton or wooden box.

TABLE 2-1. OPERATING CONTROLS, INDICATORS AND CONNECTORS

Fig. 2-2 Ind. No.	Control, Indicator and Connector	Function
1	EXT MOD INPUT PULSE	Accepts pulse signal of 0.1 usec minimum, 50 to 50,000 pulses per second when MOD SELECT is in PULSE position.
2	EXT MOD INPUT FM	Accepts modulation signal DC to 100 kHz, 3V RMS, when MOD SELECT is in FM position and modulation selector in EXT position.
3	EXT MOD INPUT AM	Accepts modulation signal DC to 20 kHz, 3V RMS when MOD SELECT is in AM position and modulation selector in EXT position. Provides internal 400 Hz and 1 kHz, modulation waveform for external purposes when modulation selector is in INT 400 Hz or 1 kHz position.
4	Modulation Selector INT 400 Hz, 1 kHz, EXT MOD	A three position switch providing capability of external modulation, 400 Hz internal or 1 kHz internal modulation.
5	ON	Power on-off switches energize or de-energize the instrument.
6	MOD SELECT FM-PULSE, FM, CW, AM, AM-FM, PULSE	A six-position switch that selects the type of modulation simultaneous FM and pulse, FM, CW, AM, simultaneous AM and FM, and pulse modulation.
7	DEVIATION RANGE kHz	A five-position switch that sets the range of FM deviation, 3, 10, 30, 100 or 300 kHz peak.
8	METER, AM, FM	When the MOD SELECT is only in the simultaneous AM-FM position, this two-position switch selects which modulation signal is displayed on the MODULATION meter.
9	AM LEVEL	Provides a means for adjusting the percentages of carrier modulation in AM. A single turn control adjusts modulation from 0 to 100%.
10	DEVIATION	In conjunction with the DEVIATION RANGE kHz switch, it provides a means for adjusting the peak carrier deviation in FM. A single turn control adjusts deviation from 0 to that set by the DEVIATION RANGE kHz switch.
11	MODULATION	A meter with two scales 0 to 100 and 0 to 30. Monitors % AM or peak deviation of FM.
12	FREQUENCY MHz INDICATOR	A frequency monitor providing a five-digit LED display. A flashing LED indicates that you are overranging and that the real first digit is not displayed. This only occurs in the 1 kHz resolution position when the frequency is above 100 MHz.
13	RESOLUTION 100 kHz, 10 kHz, 1 kHz	A three-position switch that provides frequency resolution of 100 kHz, 10 kHz or 1 kHz.
14	TUNING, COARSE	Provides a means for selecting any frequency within the 4.5 to 520 MHz range of the generator. It has about forty turns.
15	TUNING, FINE	Provides a means for fine tuning the carrier frequency. It has ten turns.

TABLE 2-1. OPERATING CONTROLS, INDICATORS AND CONNECTORS (Continued)

Fig. 2-2 Ind. No.	Control, Indicator and Connector	Function
16	AMPLITUDE	An amplitude meter with three ranges calibrated in 0 to 1V RMS, 0 to 3V RMS, and -15 to +3 dBm into a 50 ohm load. Measures calibrated 50 ohm instrument output signal amplitude when the instrument is terminated in a 50 ohm resistive load.
17	RF LEVEL Control	Provides means for adjusting the voltage level of the calibrated output signal from 10 to 100 percent of the value indicated by the amplitude level switch.
18	ATTENUATOR Selector	A thirteen position selectable precision attenuator switch providing 10 dB attenuation per step. Marked -110 to +10 dBm with corresponding voltage across 50 ohms also shown for monitor reading of full scale voltage.
19	RF OUT 50 Ω	"N" connector provides calibrated RF output levelled or modulated signal from 50 ohms source up to 1 volt level.
20	UNCAL RF	A BNC connector that provides a CW signal of 100 mV RMS minimum.
21	115/230 INPUT VOLTAGE Selector Rear Panel	A slide switch that allows operation with 115 volt or 230 volt primary power source.

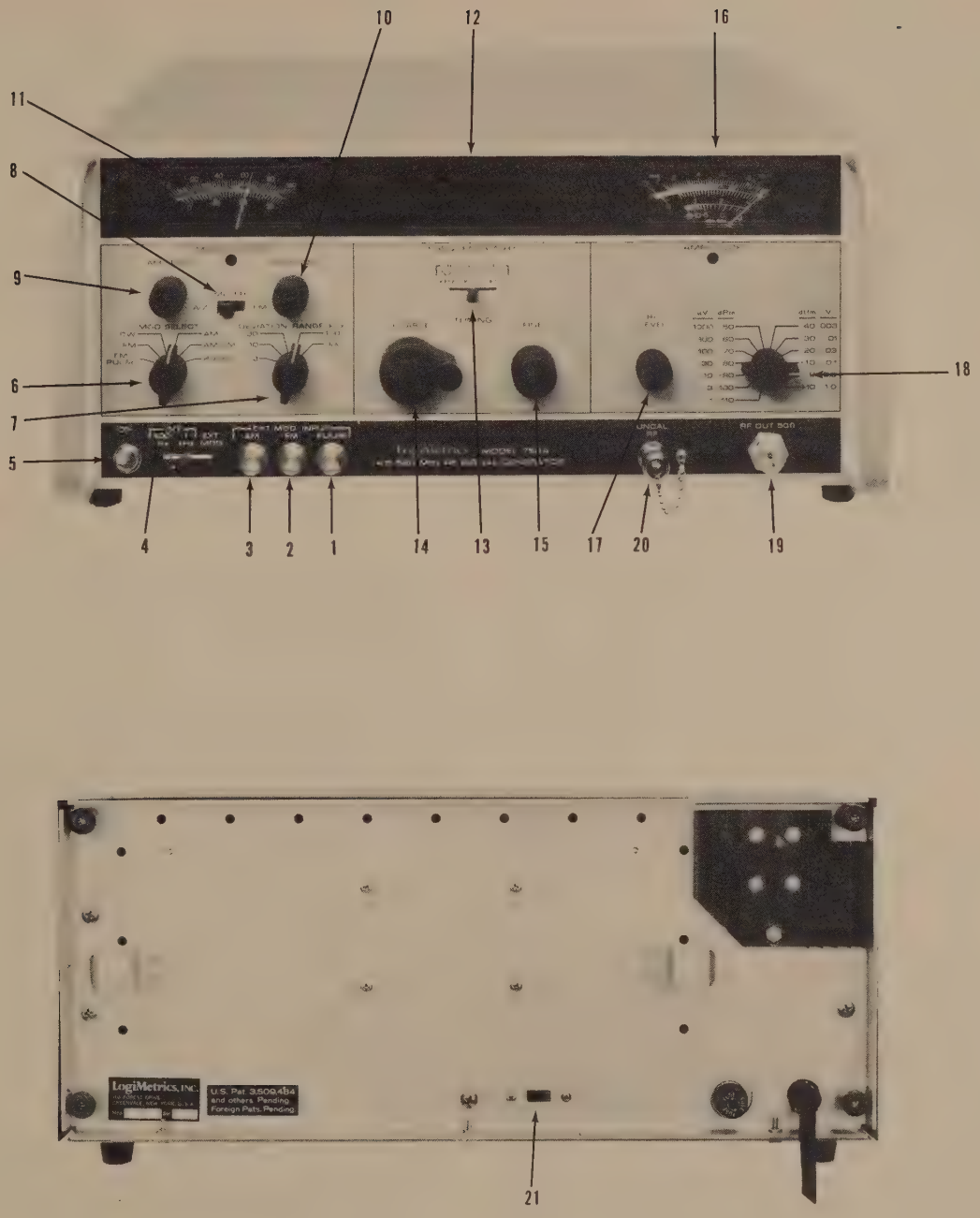


Figure 2-2. Model 750A Operating Controls, Indicators and Connectors

SECTION III
THEORY OF OPERATION

3–1. GENERAL

3-2. The Model 750A RF Signal Generator is a solid state instrument providing highly accurate and stable frequencies from 4.5 to 520 MHz in one continuous band. Output frequency is read on a five digit LED display, and resolutions of 1 kHz, 10 kHz and 100 kHz are provided. The RF output is continuously adjustable from 0.1 microvolts (-127 dBm) to 1 volt RMS (+13 dBm) into a 50 ohm load. A step attenuator provides 120 dB of attenuation in 10 dB steps. A calibrated vernier provides an additional 18 dB of amplitude adjustment. The carrier may be amplitude modulated both internally or externally from 0 to 100%, and frequency modulated both internally or externally from 0 to 300 KC peak at all frequencies. The unit may be externally pulse modulated with a minimum pulse width of 0.1 microseconds at a rate of 50 to 50,000 pulses per second.

3–3. BLOCK DIAGRAM ANALYSIS

3-4. The block diagram, figure 3-1, indicates the two major functional sections of the instrument - the Signal Section and the Counter Section. The Signal Section generates, modulates, amplifies and attenuates the signal. The Counter Section monitors the RF signal and displays its frequency.

3-5. SIGNAL SECTION. The 4.5 to 520 MHz RF signal is obtained by heterodyning a fixed 800 MHz cavity oscillator with a tunable 804.5 to 1320 MHz cavity oscillator. These are high Q stable cavity oscillators with identical drift characteristics that result in an extremely stable heterodyned signal. All modulation is accomplished in the fixed oscillator chain. The 800 MHz oscillator can be FM'd thru the deviation control. Since this is a fixed frequency oscillator, the adjustment of deviation is done only once, and there are no tracking adjustments required when tuning across the 4.5 to 520 MHz frequency range. By producing FM with a fixed frequency oscillator, extremely accurate and very high quality FM is produced. AM and pulse modulation are also accomplished in the fixed 800 MHz oscillator chain, again simplifying the circuitry and providing higher quality modulation. The AM and pulse modulators are pin diode modulator. An isolation amplifier is placed between the 800 MHz oscillator and the modulator chain. This eliminates the frequency pulling on the 800 MHz oscillator caused by the changing VSWR of the pin diode modulators when modulating.

3-6. The balanced mixer is a specially designed double balanced mixer where the intermodulation products are extremely low. The low pass filter filters out the two oscillator frequencies from the mixer output. The power amplifier is a broadband linear power amplifier that raises the signal level up to the 1 volt RMS output. Two detectors are used in the leveling loop - a pulse detector that has a fast charge time constant and an extremely long discharge time constant. The AM detector is a fast charge and discharge time constant detector and is used for CW, AM and FM modes. The level comparator compares the detector output with the reference level set up by the RF LEVEL control. Its output error voltage is fed to the AM modulator to cause the RF output that is sampled at the detector to remain constant. The internal modulation oscillator is a Wien bridge oscillator producing a 400 Hz or 1 kHz signal. An operational voltmeter is used to monitor and display the % AM and peak deviation in FM.

3-7. COUNTER SECTION. The counter derives its signal from a separate mixer that is connected before the AM or pulse modulator. This signal is amplified and then prescaled by a factor of 8 before the actual counter. The counter has five BCD divide by ten's. The first one is a high speed Schottky device and the following four are standard TTL devices. The output of all the divide by ten's go to memory latches, which store the last number of each device. This memory eliminates the "rolling" of the display during the counting interval. The outputs of the memories go to the LED display board. Also on this display board is the over range light that flashes when the counter overflows, only when the RESOLUTION switch is in the 1 kHz position and the frequency is above 100 MHz. The gating time, storage load, and reset pulses are generated in the time base section and are derived from a stable crystal oscillator.

3–8. DETAILED THEORY OF OPERATION

3-9. Paragraphs 3-10 through 3-20 contain a detailed analysis of the various circuits of the instrument.

3-10. MOD MIXER, ASSEMBLY A8. The Mod-Mixer assembly takes the output of the two cavity oscillators and divides each signal into two paths where they are mixed to provide two isolated outputs of 4.5 to 520 MHz, one for the counter and the other that is modulated and amplified to provide the output signal. A8-CR1 and A8-CR2 are PIN diodes that are used for pulse modulation. For all modulations except pulse they are forward biased and therefore offer little attenuation to the 800 MHz signal. During pulse modulation they are back biased during the "off" period of the pulse and offer a large attenuation to the 800 MHz signal. During the "on" period they are forward biased. A8-CR3 and A8-CR4 are PIN diodes that are used for AM and levelling. Their bias is supplied by the comparator A5U3 in the levelling loop. A8-L3, 4, 5, 6, 7 and C7, 8 form a band pass filter centered at 800 MHz. Its purpose is to attenuate the harmonics of 800 MHz that would cause spurious signals to be produced in mixer A8-U1. Mixer A8-U1 and A8-U2 are double balanced mixers. A8-U1 has extremely good

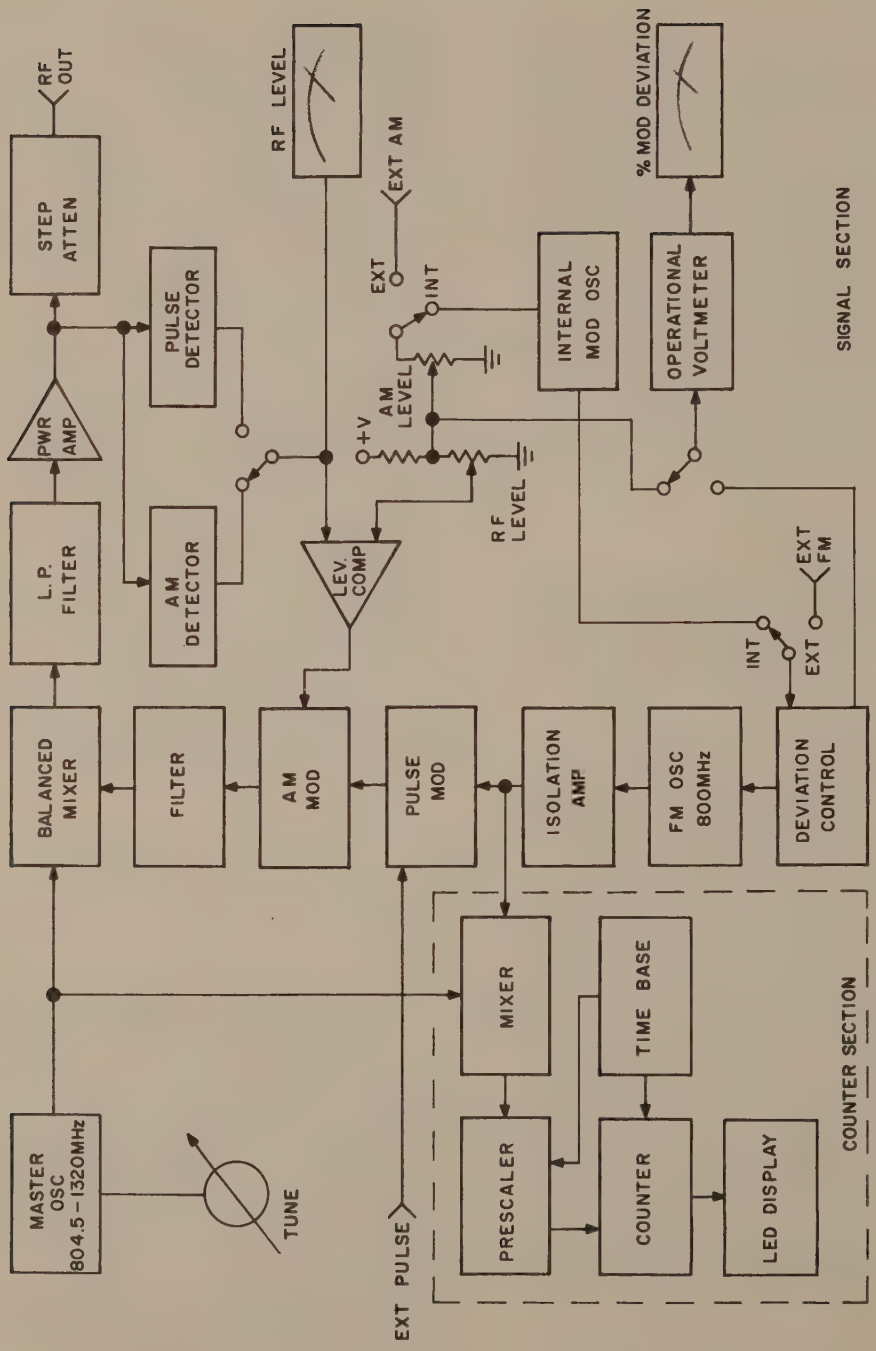


Figure 3-1. Block Diagram Model 750A RF Signal Generator

balance and therefore has extremely low spurious response products.

3-11. 800 MHz ISOLATION AMPLIFIER, ASSEMBLY A11. This amplifier eliminates the tendency for oscillator pulling due to the changing impedance of the modulators during either the AM or pulse mode of operation. It is a tuned amplifier with neutralization to improve reverse isolation.

3-12. RF AMPLIFIER, ASSEMBLY A7. The amplifier is comprised of four resistive feedback amplifier/emitter follower stages. The first stage uses the emitter follower in a Darlington configuration in order to obtain the required overall power gain. DC operating points on all the amplifiers are stabilized by use of Zener diodes in the feedback path. This forces the collector voltages to maintain voltages slightly higher than the Zener voltage. The first amplifier stage utilizes a low collector capacitance transistor so as to obtain the highest possible gain in order to yield the lowest practicable noise figure. A high frequency peaking adjustment is provided at the base of the output emitter follower of the input Darlington. Low harmonic distortion is made possible by optimizing the currents through the output stage by use of resistor trimmers in the collector of the amplifier A7Q9 and emitter of the emitter follower A7Q10. A7C18, 26, and 36 in the emitters of A7Q5, Q7 and Q10 maximize the power output at 520 MHz. Peak detector A7CR6 provides a DC voltage proportional to the RF voltage. This DC voltage is amplified by operational amplifier U1 and buffered by emitter follower Q8 and is fed to the AM LEVEL board (A5). In the pulse mode relay A7K1 removes the resistive load on the peak detector, thus stretching the detected pulse and bringing it within the bandwidth handling capability of A7U1. The stretched pulse at the output of A7Q8 is peak detected by A7CR4 and A7C31 and buffered by operational amplifier A7U2. Potentiometers A7R38 and A7R39 provide a slight forward bias to the peak detector to optimize tracking of the amplitude meter.

3-13. AM LEVEL, ASSEMBLY A5. This assembly contains an audio oscillator and calibration circuit for front panel AMPLITUDE meter. The audio oscillator A5-U1 is a Wein-bridge oscillator that generates the 400 Hz and 1 kHz signals used to provide internal modulation. The respective series and parallel resistive components are selected by the front panel modulation selector, when placed at its INT 400 Hz and 1 kHz positions. An audio level control A5-R8 adjusts the amplitude of the oscillator output and A5-DS1 stabilizes the oscillator output. The output of the audio oscillator is routed to the front panel controls for use of the desired modulation needed. For AM modulation the audio signal goes to the AM LEVEL control and then to A5-U2. This amplifier sums the audio modulation signal and a fixed DC voltage. The output is sent to front panel RF LEVEL control, then back to A5-U3. A5-U3 is amplifier/comparator which compares the RF LEVEL signal to the detected rf signal. This compared signal is amplified and fed to a complimentary pair driver A5-Q1 and A5-Q2 to drive the AM/level pin diodes in the Mod Mixer board. The rf leveling loop is comprised of RF amplifier, mod mixer, A5-U3, A5-Q1 and A5-Q2. The loop gain is adjusted by A5-R30.

3-14. FM PULSE ASSEMBLY A6. In pulse position the AM modulation PIN diodes are in the minimum attenuation state. The pulse modulation PIN diodes are in a maximum attenuation state between pulses. To accomplish this the diode is maintained at approximately 3V reverse bias. The diode is maintained by emitter follower comprised of A6-Q4 and A6-Q5. For proper spectrum the turn on and turn off time of the PIN diode must be the same. Since the diode attenuation response lags the driving voltage, leading and trailing edge overshoots are added to the driving pulses in order to minimize the absolute and differential rise and fall time of the attenuation states of the PIN modulator. Modulation pulses are fed to emitter coupled limiter A6-Q1 and A6-Q2. A6-CR3, CR5, and CR6 are for protection against excessive negative and positive voltages respectively. The collector circuit of A6-Q1 is slightly underdamped and yields leading and trailing edge voltage spikes of approximately 3 volts of 20 nanoseconds duration. The collector circuit of A6-Q2 is also slightly underdamped with a rise time of approximately 20 nanoseconds. On the leading edge of the input pulse, A6-Q2 cuts off causing the steady state value at the base of A6-Q4 to rise from approximately -2.6V to approximately +5.4V. At the same time a negative 3V spike from the collector of A6-Q1 is applied to the base of A6-Q3. The collector of A6-Q3 thus supplies extra leading edge current to base of A6-Q4 causing the PIN diode to charge to a steady state value in less than 30 nanoseconds. The same spike from collector of A6-Q1 is fed to A6-Q5; but since the spike polarity is negative, A6-Q5 does not turn on. On the trailing edge, the base of A6-Q4 reverts to approximately -2.6V. In addition a positive spike from collector of A6-Q1 is applied to the base of A6-Q5 causing the collector of Q6-Q5 to draw extra current for the first 20 nanoseconds. This current empties the stored charge in the diode and the feed cable capacitance and causes the diode to attain maximum attenuation in less than 30 nanoseconds.

3-15. Included on the A6 assembly is a buffer amplifier A6-U1 for the FM modulation. Also fine tuning components, which is a passive adder circuit, which sums the FM modulation signal and FINE TUNE signal for application to the FM oscillator.

3-16. PRESCALER BOARD ASSEMBLY A3. This board consists of a two stage ultra-wide band amplifier (4.5 - 520 MHz) and high frequency dividers. The first stage of the amplifier portion consists of A3-Q1, a common base amplifier, and A3-Q2 and A3-Q3 emitter followers. The second stage consists of A3-Q4, another common base amplifier, and A3-Q5, A3-Q6, A3-Q7 emitter followers. Signal detector circuit A3-CR1 and A3-CR2, A3-Q8, and associated circuitry is used to inhibit A3-U3 when the signal is too low to process accurately. A3-U5 is used to convert the amplifier output to ECL levels and shaping. A3-U1 and A3-U2 are UHF divide by two's. A3-U3 is used as a buffer and gate, which is controlled by the signal detector and the precision timing interval from the time base board. A3-Q9 and A3-Q10 make up a differential amplifier to

convert ECL level to TTL. A3-Q11 is an emitter follower to buffer the signal.

3-17. COUNTER BOARD ASSEMBLY A2. A2-U3, a Schottky device, and A2-U1 and A2-U2 high speed devices form a high speed BCD counter. A2-U4 to A2-U7 are standard BCD counters. A2-U1 to A2-U7 reset during the reset interval from the time base board. A2-U8 to A2-U12 are strobed memory devices, which store the counted BCD numbers right after the timing interval. These devices are strobed with the storage load pulse.

3-18. DISPLAY BOARD ASSEMBLY A1. The display board consists of five LED decade displays A1-DS1 to A1-DS5. These devices have decoders built in which decode the stored BCD information from the counter and display it in decade form. A1-DS6 is an overflow indicator LED which will blink when the counter overflows in the 1 KHz resolutin position.

3-19. TIME BASE BOARD ASSEMBLY A4. The very stable 1 MHz crystal oscillator consisting of A4-Q1 and A4-Y1 and associated circuitry is fed to A4-Q2 an emitter follower for driving gate A4-U1 used for shaping. The output of A4-U1-6 is fed to A4-U2, a divide by ten, then to A4-U4, another divide by ten, and A4-U5, a set of NAND gates wired up for an "OR" function. A4-U5 is controlled by A4-U8-A. A4-U5 will either place A4-U4 in series with A4-U2 or bypass it. This is used for the expand feature which is controlled by the RESOLUTION switch on the front panel.

The output of A4-U5 is fed to A4-U6 and A4-U7, both divide by tens. The output of A4-U7 is the gate which has an 80%/20% duty cycle. In the 10 kHz and 100 kHz position of the RESOLUTION switch the gate period is 1 Msec and 10 Msec for 1 kHz resolution. The 80% portion of the gate is called the precision timing interval to enable the counter to count. The 20% portion of the gate is the reset interval in which the counter is inhibited, and the sequential storage load and reset pulse are enabled. A4-U10 and A4-U8-B take the BCD information from A4-U6 and A4-U7 and decode them to get two sequential and timed pulses during the reset interval. The first pulse is the storage load and the second pulse is the reset. A4-U11B and A4-U11A are inverters and buffers for the storage load and reset pulses respectively. A4-U8C is used for inverting the overflow pulses from the counter. A4-U9 is the overflow detector and memory. A4-U3 divides down the gate to the proper blinking rate for the overflow LED on the display. A4-U1B is a gate for the overflow LED which is controlled by A4-U9.

3-20. POWER SUPPLY, ASSEMBLY A10. The power supply develops the regulated voltages required by the instrument. The AC input voltages are supplied by the secondary windings of transformer TO1. The primary circuit of TO1 contains a selector switch, SO8, which allows TO1 to be energized from a 115 VAC or 230 VAC source. Secondary windings 6-8 with 7 as the grounded center tap, supply the +15 volt regulator and the -15 volt regulator. The +15 volt regulator circuit is a standard series regulator with current limiting and an adjustment A10R24. The +15 volt regulator output provides the reference for -15 volts, +32 volts +20 volts and +5.2 volt regulators and when A10R24 is set for the proper output of the +15 volt regulator, all other regulators will supply their proper voltages. Secondary windings 9-5 with 7 as the grounded center tap supply the +32 volt regulator, and the +20 volt regulator.

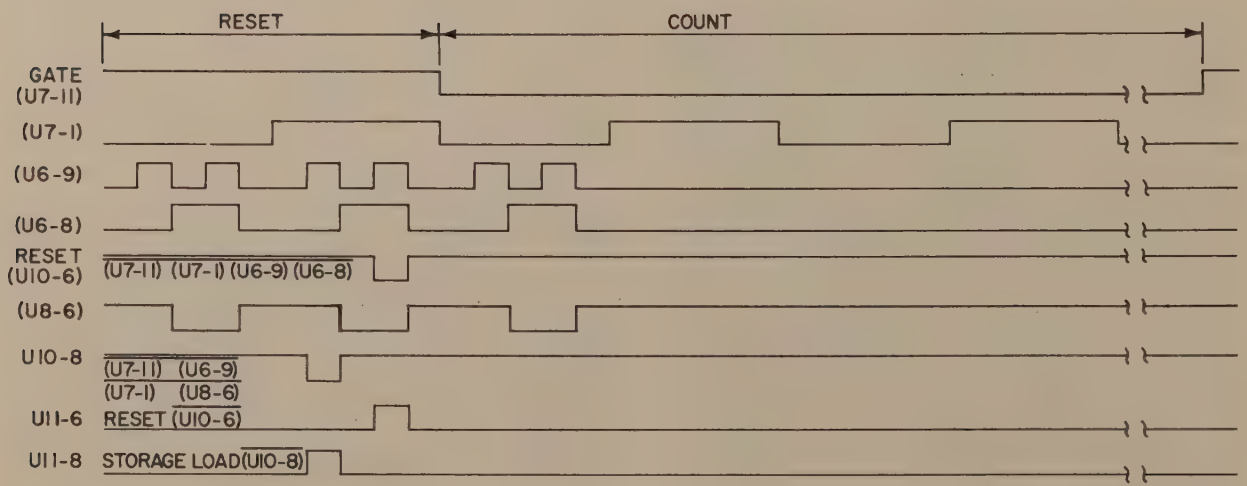


Figure 3-2. Model 750A Time Base Timing Diagram

SECTION IV
MAINTENANCE

4–1. GENERAL

4-2. This section contains maintenance and alignment procedures for the Model 750A RF Signal Generator. Included are a list of test equipment required, minimum performance standards that are used to ascertain equipment capability, and trouble-shooting procedures.

4–3. TEST EQUIPMENT REQUIRED

4-4. The test equipment required for maintenance and alignment of the Model 750A is listed in table 4-1.

4–5. MINIMUM PERFORMANCE STANDARDS

4-6. The purpose of the minimum performance standards listed in table 4-3 is to determine if the Model 750A is operating in compliance with the specifications. Prior to performing the minimum performance checks refer to table 4-2 for initial instrument settings.

4–7. TROUBLE SHOOTING

4-8. Should the Model 750A fail to meet any of the specifications outlined in table 4-3, the trouble may be determined and corrected through the use of table 4-4, referred to in table 4-3. If the location of the trouble is indefinite or cannot be localized, refer to the step that most closely resembles the trouble encountered.

4–9. DISASSEMBLY AND REASSEMBLY INSTRUCTION

4-10. Disassembly and reassembly instructions for the instrument are given in paragraphs 4-11 through 4-15. Assembly locations are shown in figures 4-1 and 4-2.

Note

Do not disassemble the instrument beyond the point at which the necessary repair or replacement can be made. Perform the applicable minimum performance checks of table 4-3 after any replacement or repair.

4-11. REMOVAL OF TOP COVER. The top cover is a U-shaped cover and is removed by removing six screws, with their respective flat and lock washers, from the sides of the instrument.

4-12. REMOVAL OF BOTTOM COVER. The bottom cover is a flat plate with the stand attached. To remove the bottom cover, remove the nine screws with their respective flat and lock washers.

4-13. REMOVAL OF THE DIGITAL COVER. Removal of this cover will allow access to the Prescaler, Assembly A3; Counter, Assembly A2; Time Base, Assembly A4; AM LEVEL Assembly A5 and FM Pulse, Assembly A6. To remove this cover remove twelve screws, 3/8" length, with their respective lock washers, from top of cover.

TABLE 4-1. TEST EQUIPMENT REQUIRED

Name	Manufacturer and Model Number	Name	Manufacturer and Model Number
Differential Voltmeter	Fluke, Model 871A	Pad 6 dB (BNC)	Texscan FP50-6 dB
Power Meter	Boonton, Model 142AD	Oscilloscope	Tektronix Model 454
Spectrum Analyzer	HP 141T, 8554L, 8552B		
Counter	HP Model 4245L	Multimeter	Simpson Model 260
Pad 10 dB (BNC)	Texscan FP50-10 dB	Pulse Generator	Data Pulse Model 101
AM/FM Modulation Meter	Marconi Model TF2300		

CAUTION

All PC boards in the digital box are plug-in type with the exception of the Prescaler Assembly A3, which also has eight screws (4 each on 2 connectors) located on the bottom of chassis, holding the board. These screws must be removed before removal of the board..

4-14. REMOVAL OF THE RF COVER. Removal of this cover will allow access to the RF Amplifier, Assembly A7. To remove this cover proceed as follows:

a. Remove six screws, 3/8" in length running vertically on the rear panel with their respective lock washers.

b. Remove eight screws, 3/8" in length running across the rear panel, with their respective lock washers. These screws retain a threaded bar which in turn retains the upper lip of the RF cover to the internal surface of the rear panel.

c. Remove twelve screws, 1/4" in length with their respective lock washers, from the bottom and side lips of the RF cover.

4-15. REMOVAL OF THE MOD MIXER COVER. Removal of this cover will allow access to the Mod Mixer, Assembly A8. To remove this cover remove ten screws 3/8" in length, with their respective lock washers from around bottom of cover.

TABLE 4-2. INITIAL CONTROL SETTINGS FOR MINIMUM PERFORMANCE STANDARDS

Control	Setting
(Front Panel)	
Power Switch	Off
MOD SELECT	CW
TUNING	Maximum counterclockwise
RESOLUTION	10 KHz
(Rear Panel)	
115/230 Switch	115

4–16. ADJUSTMENT AND CALIBRATION PROCEDURES

4-17. Adjustment and calibration procedures for the Model 750A are given in paragraphs 4-18 through 4-25 and must be performed in the order given for proper calibration due to interaction of adjustments.

4-18. PREALIGNMENT SETUP. Prior to making any internal adjustments proceed as follows:

a. Remove top and bottom covers of the instrument. No other covers are required to be removed for the normal calibration routine unless noted in the following calibration procedures.

b. Set the instrument controls listed in table 4-5 to the setting indicated.

c. Connect the instrument to a 115 volt, 60 Hz source.

d. Adjust MODULATION and AMPLITUDE meters on front panel to 0 (zero) by means of their respective mechanical screwdriver adjustments.

e. Set power switch to its ON position.

4-19. POWER SUPPLY ADJUSTMENT. To adjust the power supply to the proper values, refer to figure 4-2 and proceed as follows:

a. Connect a differential voltmeter to the +15 volt pins A10-11.

b. Adjust A10-R24 for a 15.0 volt indication on the differential voltmeter.

c. Remove all test equipment from instrument.

4-20. REFERENCE FREQUENCY OSCILLATOR ADJUSTMENT. To adjust the frequency of the reference frequency oscillator refer to figure 4-1 and proceed as follows:

a. Remove digital cover.

b. Connect the counter to the REF FREQ 1 MHz TP (A4TP1) connector on A4.

c. Set the counter to read with 1/10 of a Hertz resolution.

d. Adjust the Internal Reference Frequency (1 MHz) Adjust A4C1 for 1,000,000 Hz on counter (within 1 Hz).

e. Remove all test equipment from instrument.

TABLE 4-3. MINIMUM PERFORMANCE STANDARDS

Step	Purpose	Procedure	Normal Indication	Abnormal Indication Reference
1	Evaluate operating power conditions.	Connect instrument, and adaptor, if necessary, to power source outlet. Set power switch to its ON position.	The FREQUENCY MHz display will illuminate indicating the frequency being generated. The front panel MODULATION and AMPLITUDE meters may deflect depending upon how their respective controls are set.	1. Instrument does not appear to function, refer to table 4-4, step 1. 2. The FREQUENCY MHz display is extinguished, refer to table 4-4, step 2. 3. The FREQUENCY MHz display is static and unchanging or indicating an erroneous value, refer to table 4-4, step 3. 4. Front panel AMPLITUDE meter does not function properly, refer to table 4-4, step 4.
2	To evaluate output level accuracy.	1. Connect the RF power meter to the RF OUT 50Ω Connector. 2. Adjust the TUNING control for 100 MHz on the display. 3. Set the output attenuator to its 0 dBm/0.3V position. 4. Adjust the RF LEVEL control to indicate 0 dB (.707 volts) on the AMPLITUDE meter.	1. Observe the RF power meter to indicate 0 dBm ±1 dBm.	1. For slight deviations from the desired result, the AMPLITUDE meter calibration may be at fault, refer to paragraph 4-22.
3	To evaluate output leveling capability.	1. Set the output attenuator to its 0 dBm/0.3V position. 2. Adjust the RF LEVEL control for 0 dB (.707 volts). 3. Tune the instrument through the frequency range of 4.5 to 520 MHz by means of the TUNING control.	1. The RF power meter indication should deviate less than ±0.5 dB over the entire frequency range.	1. If output leveling is not as specified, refer to paragraph 4-22.

TABLE 4-3. MINIMUM PERFORMANCE STANDARDS (Continued)

Step	Purpose	Procedure	Normal Indication	Abnormal Indication Reference
4	To evaluate AM modulation accuracy.	1. Disconnect the RF power meter from the RF OUT 50Ω Connector. 2. Connect the modulation meter to the RF OUT 50Ω Connector and adjust to measure % AM modulation. 3. Set the modulation selectors to INT 1 kHz, and AM. 4. Adjust the AM LEVEL control to indicate 30% modulation on the MODULATION meter. 5. Adjust TUNING control for 10 MHz on the display. 6. Set the output attenuator to its 0.3V/ 0 dBm position. 7. Adjust RF LEVEL control to full scale, 1 volt.	1. Modulation meter should indicate AM modulation of 25% to 35%.	1. For slight deviations from the desired result the modulation level calibration may be at fault, refer to paragraph 4-23. 2. If MODULATION meter does not function check modulation meter and meter circuitry on FM-Pulse A6, primarily A6U2. 3. If proper modulation levels cannot be achieved refer to table 4-4, step 6.
		8. Adjust the AM LEVEL control to indicate 70% modulation on the MODULATION meter.	1. Modulation meter should indicate AM modulation of 65% to 75%.	
5	To evaluate FM modulation accuracy.	1. Set the modulation selectors to INT 1 kHz, and FM. 2. Set the DEVIATION RANGE kHz to 100 position. 3. Adjust the DEVIATION control for 100 on MODULATION meter.	1. Modulation meter should indicate FM deviation of 95 kHz to 105 kHz.	1. For slight deviations from the desired result, the modulation level calibration may be at fault. Refer to paragraph 4-24. 2. If proper modulation cannot be ahcieved, refer to table 4-4, step 7.

TABLE 4-3. MINIMUM PERFORMANCE STANDARDS (Continued)

Step	Purpose	Procedure	Normal Indication	Abnormal Indication Reference
6	To evaluate pulse modulation.	1. Remove modulation meter from RF OUT 50Ω Connector. 2. Connect oscilloscope to RF OUT 50Ω Connector. 3. Set MOD SELECT to pulse. 4. Connect pulse generator to EXT PULSE connector, set for 3 volts @ 1K repetition rate and square wave.	1. Scope should show CW wave pulse modulated.	1. If no pulse modulation is present, refer to table 4-4, step 8.
7	To evaluate counter operation.	1. Connect the counter to the RF OUT 50Ω Connector. 2. Set RESOLUTION to 1 kHz. 3. Adjust TUNING 10.000 MHz on the display.	The counter should indicate the frequency noted in procedural step 3, ±500 Hz.	1. For slight deviations from the desired result, the counter calibration may be at fault, refer to paragraph 4-20. 2. If proper indication cannot be achieved, refer to table 4-4, step 3.

TABLE 4-4. TROUBLESHOOTING PROCEDURE

Step	Symptom	Troubleshooting Procedure
1	Instrument does not appear to function.	1. Check fuse F01, switch S07, power cable and setting of switch S08. 2. Check power transformer T01. 3. Check Power Supply, A10 outputs.
2	FREQUENCY MHz display does not illuminate.	1. Check Power Supply, A10, +5.2 volt output. 2. Check Display, A1.
3	FREQUENCY MHz display is static and unchanging or indicating an erroneous value.	1. Connect the counter to the UNCAL RF output connector and observe the oscillator output. If the counter indicates an erroneous output or if the output cannot be varied by the TUNING control check the Main Oscillators, and Mod Mixer, Assembly 8. 2. Check Mod Mixer, A8. 3. Check Power Supply, A10. 4. Check Time Base, A4. 5. Check Prescaler, A3. 6. Check Counter, A2. 7. Check Display, A1.
4	AMPLITUDE meter does not function properly.	1. Connect the RF power meter to the RF OUT 50Ω Connector and observe whether or not an output is present. If an output is observed check the AMPLITUDE meter, the detected RF from the RF Amplifier, A7, and the meter circuitry on AM LEVEL, A5. If no output is observed at the output connector proceed with the following steps. 2. Check Attenuator, AT1. 3. Check RF Amplifier, A7. 4. Check Low Pass Filter, A9. 5. Check Mod Mixer, A8. 6. Check AM LEVEL, A5, primarily A5U3, A5Q1, A5Q2, and A5U2. 7. Check RF LEVEL control, R06.
5	Leveling is not achieved over entire frequency range.	1. Check Mod Mixer A8. 2. Check detected RF from RF Amplifier, A7. 3. Check AM LEVEL A5, primarily A5U2 and A5U3.
6	AM Modulation levels cannot be achieved.	1. Check AM LEVEL, A5, Oscillator, A5U1. 2. Check AM LEVEL control, R02. 3. Check AM LEVEL, A5, A5U2. 4. Check FM Pulse A6, A6U2. 5. Check Mod Mixer, A8.

TABLE 4-4. TROUBLESHOOTING PROCEDURE (Continued)

Step	Symptom	Troubleshooting Procedure
7	FM Modulation cannot be achieved.	1. Check AM LEVEL, A5, Oscillator, A5U1. 2. Check DEVIATION control, R03. 3. Check FM Pulse A6, A6U1. 4. Check DEVIATION RANGE kHz control. 5. Check FM Pulse A6, A6U2. 6. Check FM Oscillator.
8	Pulse Modulation cannot be achieved.	1. Check FM Pulse A6, A6Q1 through A6Q5 inclusive and associated circuitry. 2. Check Mod Mixer, A8.

TABLE 4-5. INITIAL CONTROL SETTINGS FOR ALIGNMENT AND CALIBRATION

Control	Setting
(Front Panel)	
Power Switch	Off
MOD SELECT	CW
TUNING	Maximum counterclockwise
RESOLUTION	100 kHz
Amplitude Attenuator	0.1 volt (-10 dBm)
(Rear Panel)	
115/230 Switch	115

4-21. ISOLATION AMPLIFIER ADJUSTMENT. To adjust the isolation amplifier, refer to figure 4-1 and proceed as follows:

a) Remove 2 screws holding Isolation Amplifier to chassis.

b) Remove COAX cables from Isolation Amplifier.

c) Connect a 10 dB pad to the cable of the FM Oscillator.

d) Connect a COAX cable from the 10 dB pad to the Spectrum Analyzer.

e) Set up a reference level.

f) Connect the input of Isolation Amplifier to the cable from the FM oscillator, and 10 dB pad and cable to the output of Isolation Amplifier.

g) Adjust A11C6, A11C4, A11C5 for 5 to 6 dB below reference level in e).

h) Remove coax cables from input of Isolation Amplifier and 10 dB pad.

i) Connect FM oscillator cable to 10 dB pad (still connected to Isolation Amplifier output).

j) Connect a 6 dB pad to Isolation Amplifier input.

k) Connect the spectrum analyzer to 6 dB pad.

l) Adjust A11C6, A11C4, A11C5 for 35 dB minimum below reference level in f).

m) Repeat steps f) through m) inclusive until specifications of forward gain = -5 dB ±2 dB and reverse gain of -29 dB minimum have been met.

n) Reconnect input of Isolation Amplifier to FM oscillator cable, and output to Mod Mixer.

o) Connect Isolation Amplifier with 2 mounting screws and associated hardware to chassis.

4-22. MOD-MIXER ADJUSTMENT. To adjust the Mod-Mixer refer to figure 4-1 and proceed as follows:

a) Remove the Mod-Mixer cover.

b) Connect a VOM to A8E4 and chassis ground.

c) Adjust A8C7 and A8C8 for a minimum voltage at A8E4, this should be less than 2 volts.

d) Remove all test equipment.

e) Replace Mod-Mixer cover and associated hardware.

4-23. RF OUTPUT ADJUSTMENT. To adjust the AMPLITUDE meter, refer to figure 4-1 and proceed as follows:

a) Remove the RF amplifier (A7) cover and associated hardware.

b) Remove the digital box cover and associated hardware.

c) Connect power meter to RF OUT 50Ω Connector.

d) Adjust TUNING for 4.5 MHz on display.

e) Connect scope to A7E7.

f) Adjust A5R30 to point where just before oscillation occurs.

g) Remove oscilloscope from unit.

h) Adjust RF LEVEL for -7 dBm on power meter.

i) Adjust A5R3 for full scale reading on AMPLITUDE meter (1 volt on 1 voltscale or +3dB on dB scale).

j) Adjust RF LEVEL for -20 dBm on power meter.

k) Adjust A7R38 for -10 dB on dB scale of AMPLITUDE meter (0.22 volts on 1 volt scale).

l) Connect a pulse generator (1 kHz repetition rate with a 0.5 millisecond pulse width and a 3 volt peak to peak minimum) to the EXT MOD INPUT PULSE BNC connector.

m) Remove power meter from unit.

n) Connect Spectrum Analyzer to RF OUT 50Ω connector.

o) Adjust Spectrum Analyzer for a reference level (the level at the output of the generator is going to be used as a reference).

p) Set mod select to PULSE position.

q) Adjust A7R39 so that the peak of the pulse is the same as the reference level as in o).

r) Remove all test equipment from unit.

4-24. AM MODULATION ACCURACY ADJUSTMENT. To adjust the AM modulation accuracy, refer to figure 4-1 and proceed as follows:

a) Set modulation select to AM.

b) Connect scope to J7E5.

c) Adjust A5R8 for 10 volts p-p on scope.

d) Adjust RF LEVEL for full scale reading on AMPLITUDE meter.

e) Connect modulation meter to RF OUT 50Ω connector.

f) Adjust AM LEVEL for 50% AM on modulation meter.

g) Adjust A6R10 for 50% on MODULATION meter.

h) Adjust RF LEVEL for 0.2V on AMPLITUDE meter 1 volt scale.

i) Adjust A5R18 for 50% AM on modulation meter.

j) Check modulation at full scale on AMPLITUDE meter, and if needed, redo steps f) through i) inclusive.

k) Remove scope equipment from unit.

4-25. FM MODULATION ACCURACY ADJUSTMENT. To adjust the FM modulation accuracy, refer to figure 4-1 and proceed as follows:

a) Set modulation select to FM.

b) Set DEVIATION RANGE kHz to 100.

c) Adjust DEVIATION for 100 kHz deviation on modulation meter.

d) Adjust A5R11 for 100 (full scale) on MODULATION meter.

e) Remove all test equipment from unit.

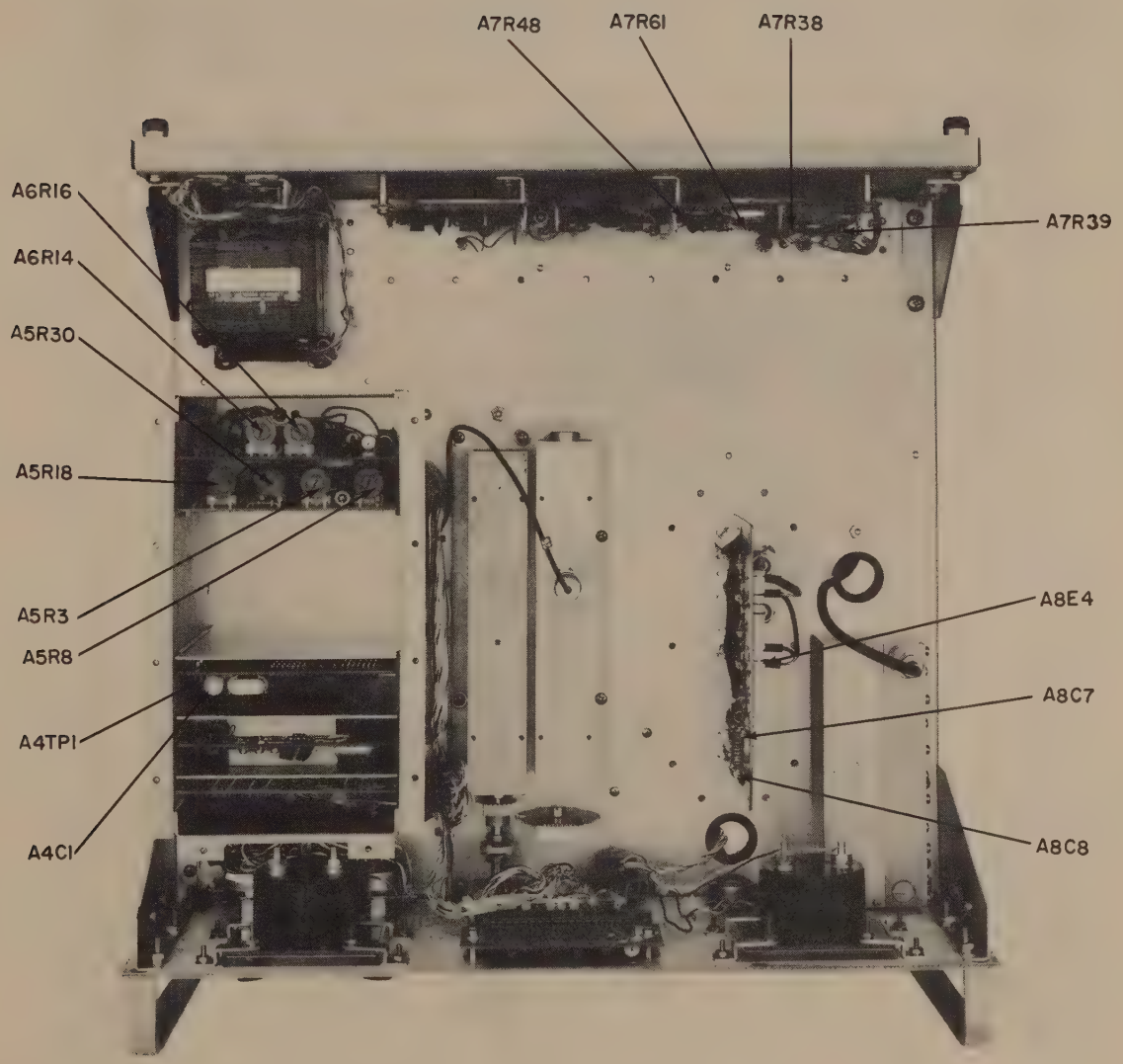


Figure 4-1. Model 750A, Top View, Cover Removed

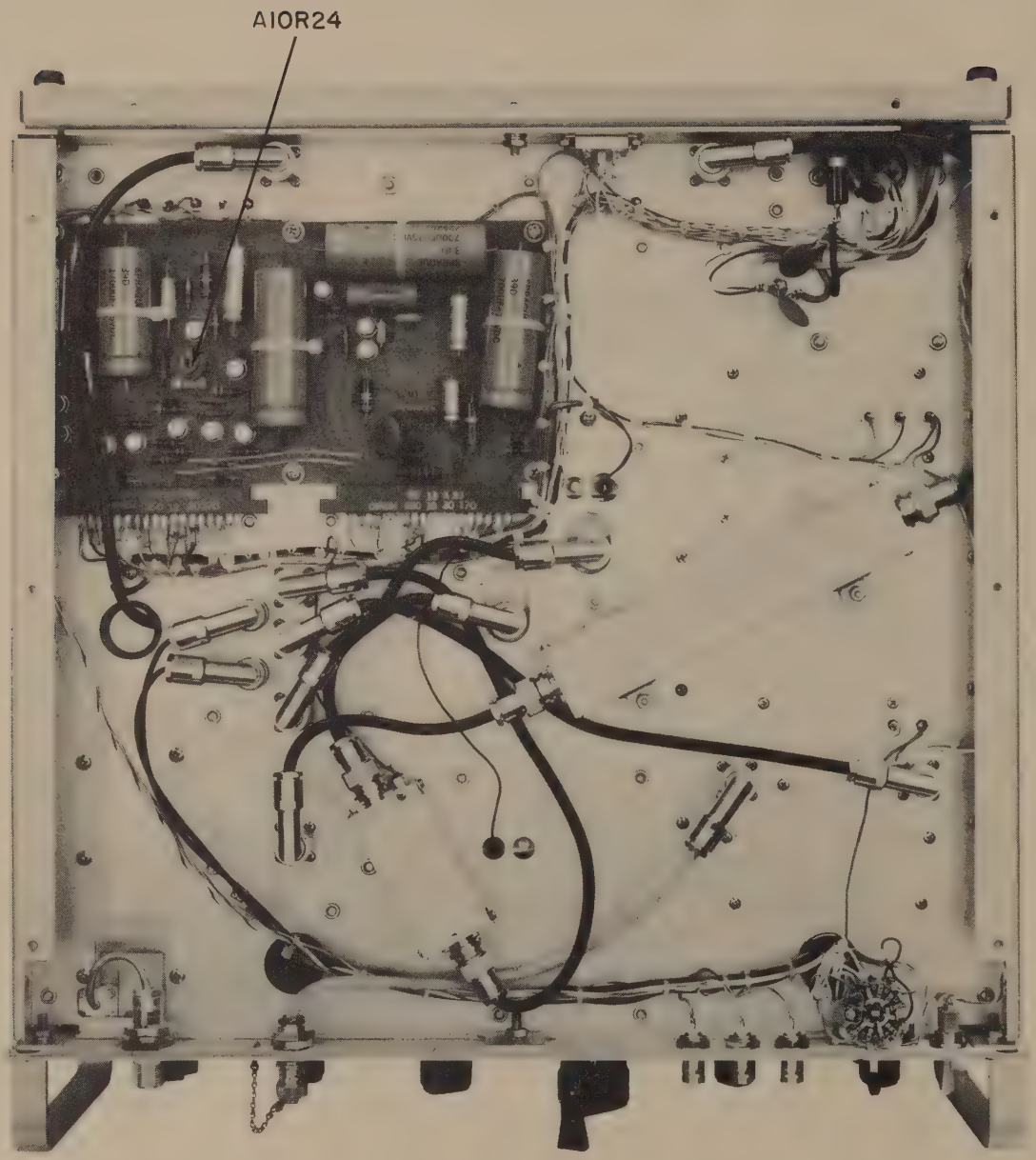


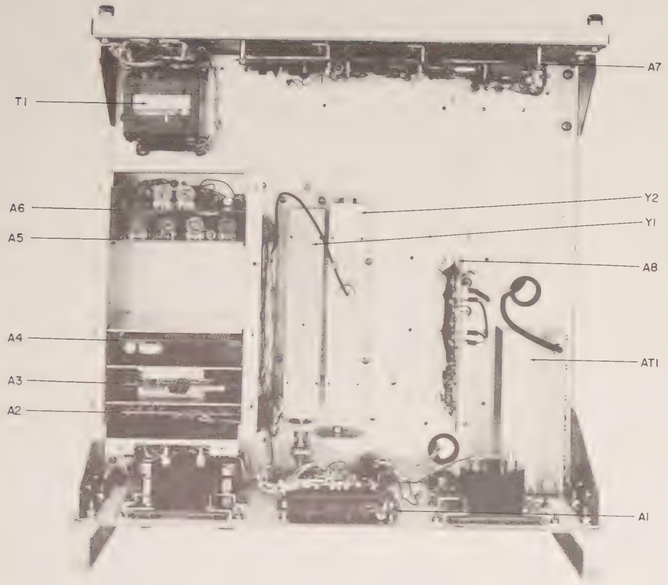
Figure 4-2. Model 750A, Bottom View, Cover Removed

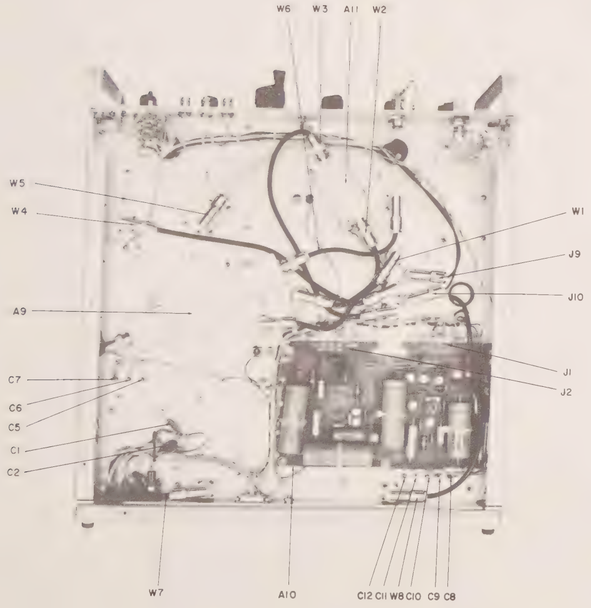
SECTION V

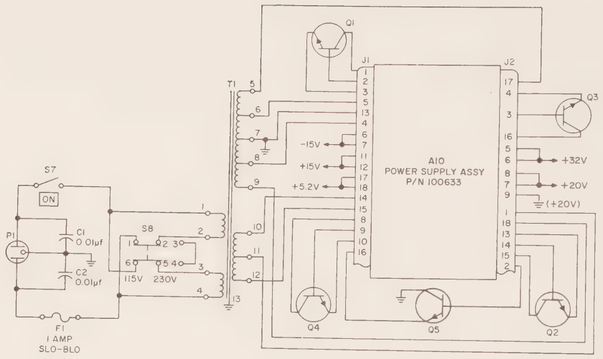
SCHEMATIC DIAGRAMS

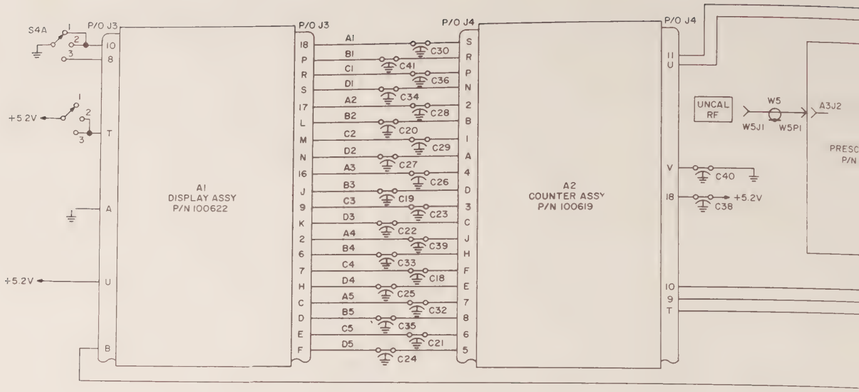
5–1. GENERAL

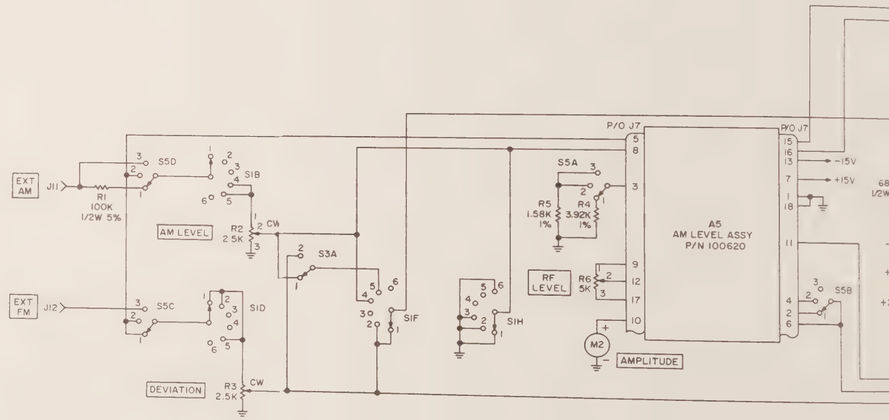
5-2. This section contains the schematic diagrams and parts location illustration that are essential aids in the maintenance of the RF Signal Generator. The schematic diagrams are to be employed in conjunction with Section III to help the technician understand the operation of the units. Both the schematic diagrams and the parts location illustrations are to be used in conjunction with Section IV to facilitate troubleshooting and maintenance operation.

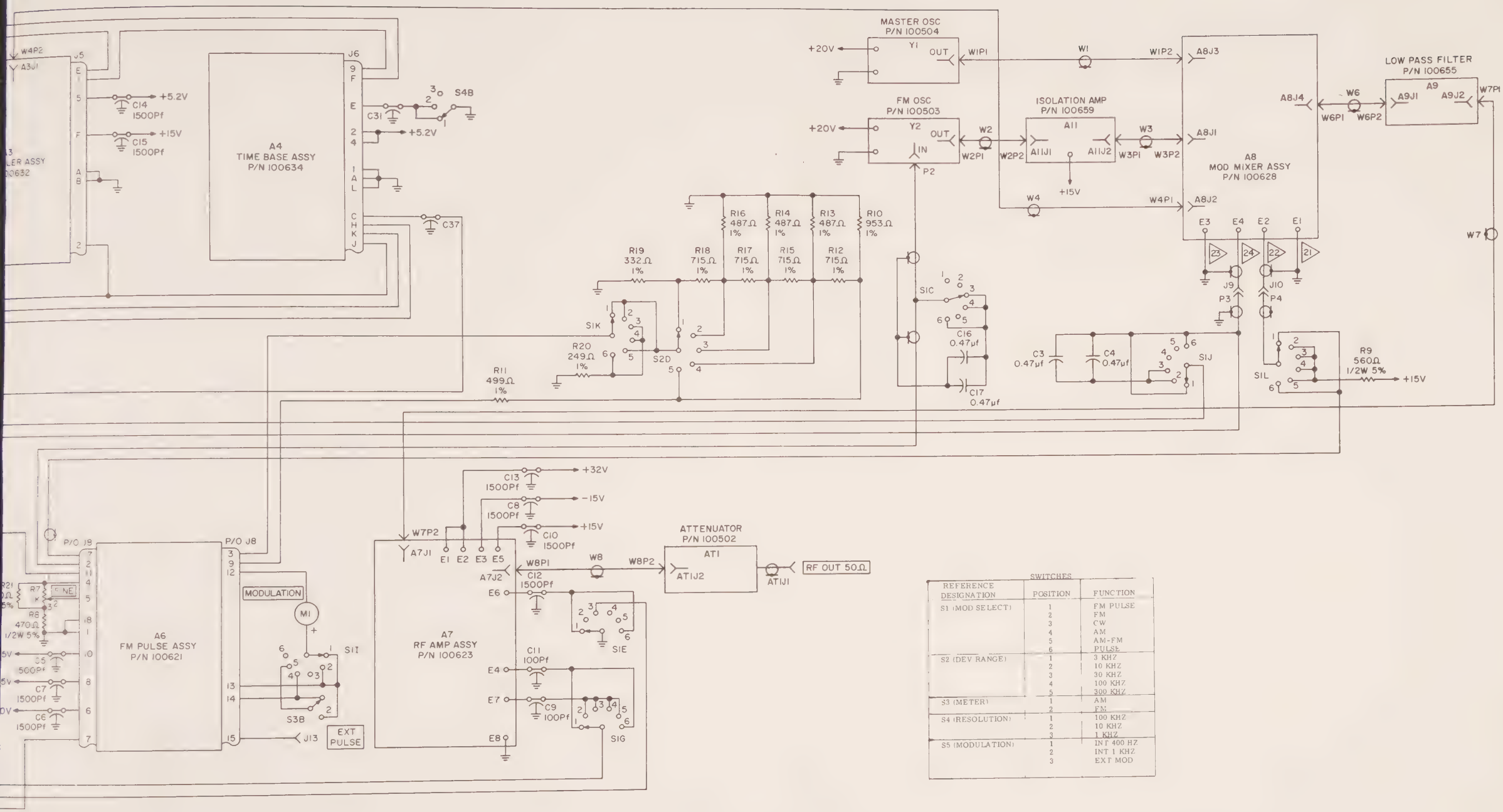

A7
T1
A6
A5
Y2
Y1
A8
A4
A3
A2
AT1
A1


W6
W3
A11
W2
W5
W4
W1
J9
A9
J10
J1
J2
C7
C6
C5
C1
C2
W7
A10
C12 C11 W8 C10 C9 C8


Q1
J1
J2
T1
S7
ON
P1
C1
0.01µf
C2
0.01µf
S8
115V
230V
F1
1 AMP
SLO-BLO
-15V
+15V
+5.2V
A10
POWER SUPPLY ASSY
P/N 100633
Q3
+32V
+20V
(+20V)
Q4
Q5
Q2

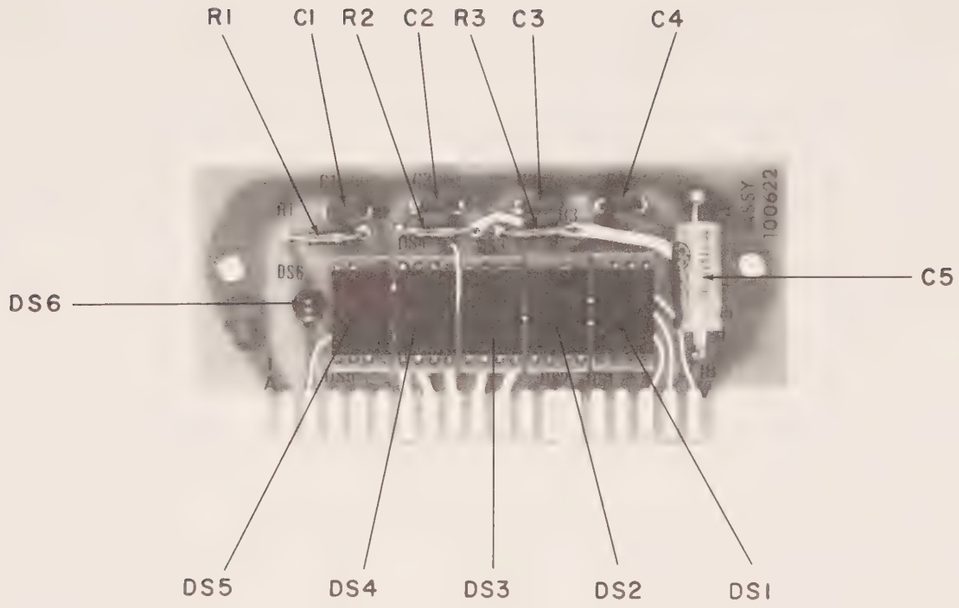

S4A
P/O J3
+5.2V
+5.2V
A1
DISPLAY ASSY
P/N 100622
P/O J3
P/O J4
A2
COUNTER ASSY
P/N 100619
P/O J4
UNCAL
RF
W5
W5J1
W5P1
A3J2
C40
C38
+5.2V


P/O J7
P/O J7
EXT
AM
J11
R1
100K
1/2W 5%
S5D
S1B
AM LEVEL
R2
2.5K
CW
S3A
S5A
R5
1.58K
1%
R4
3.92K
1%
A5
AM LEVEL ASSY
P/N 100620
EXT
FM
J12
S5C
S1D
S1F
S1H
RF
LEVEL
R6
5K
M2
AMPLITUDE
DEVIATION
R3
2.5K
CW
S5B
-15V
+15V



SWITCHES		
REFERENCE DESIGNATION	POSITION	FUNCTION
S1 (MOD SELECT)	1	FM PULSE
	2	FM
	3	CW
	4	AM
	5	AM-FM
	6	PULSE
S2 (DEV RANGE)	1	3 KHZ
	2	10 KHZ
	3	30 KHZ
	4	100 KHZ
	5	300 KHZ
S3 (METER)	1	AM
	2	FM
S4 (RESOLUTION)	1	100 KHZ
	2	10 KHZ
	3	1 KHZ
S5 (MODULATION)	1	INT 400 HZ
	2	INT 1 KHZ
	3	EXT MOD

Figure 5-1. Interconnection Diagram


R1
C1
R2
C2
R3
C3
C4
C5
DS6
DS5
DS4
DS3
DS2
DS1

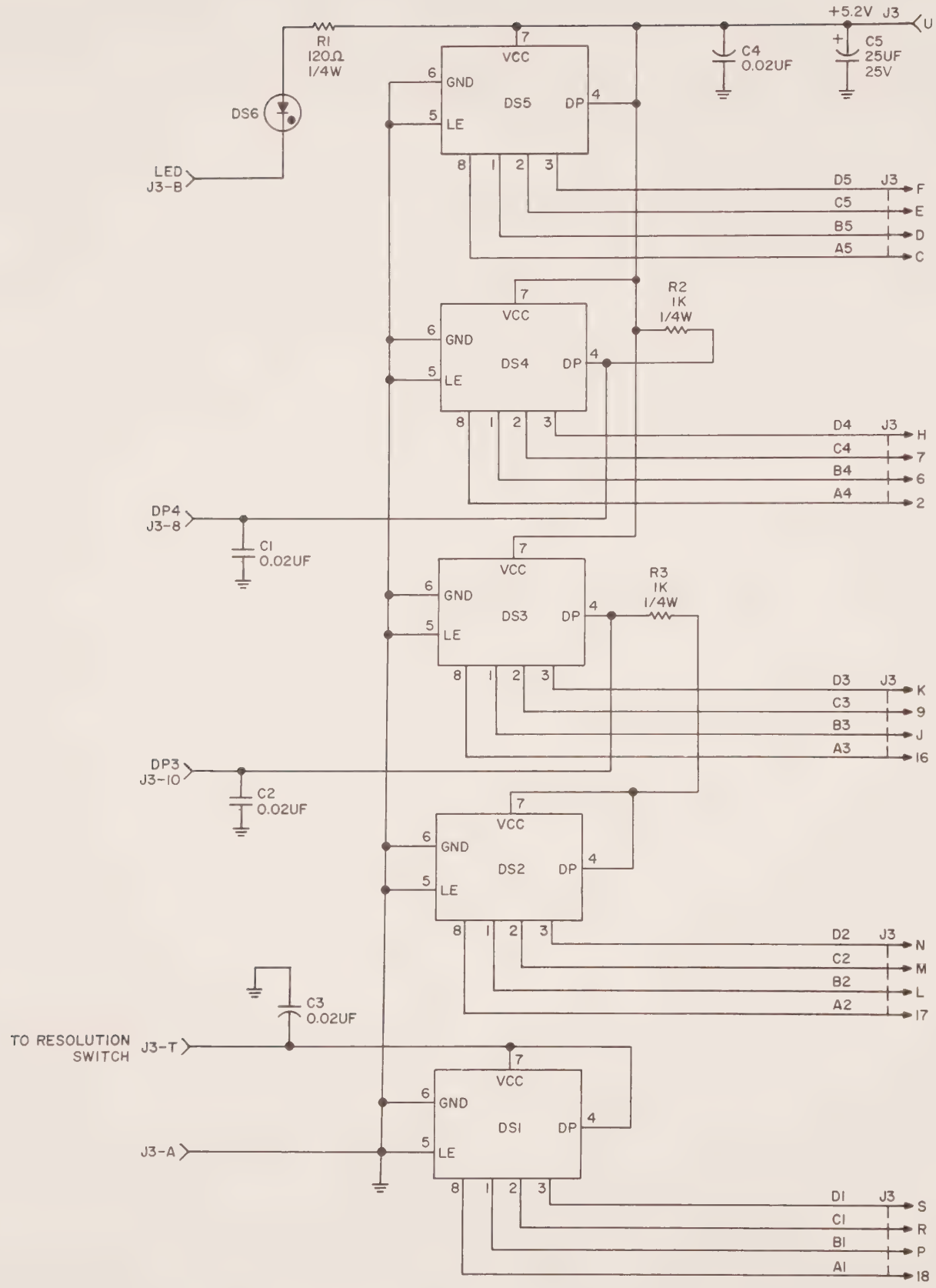
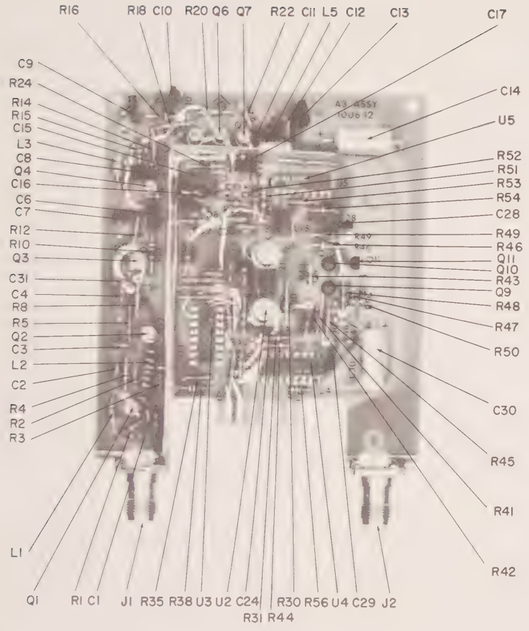
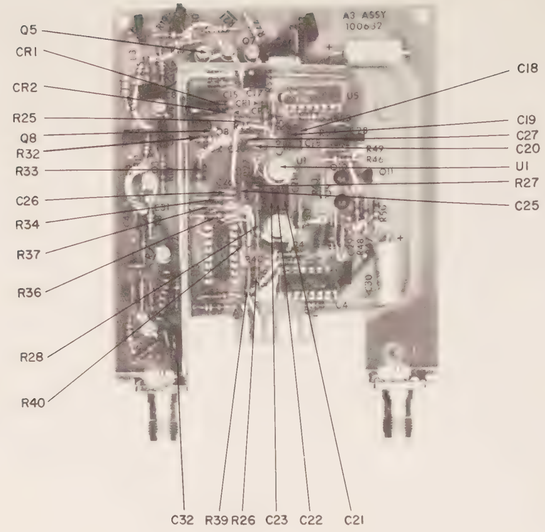
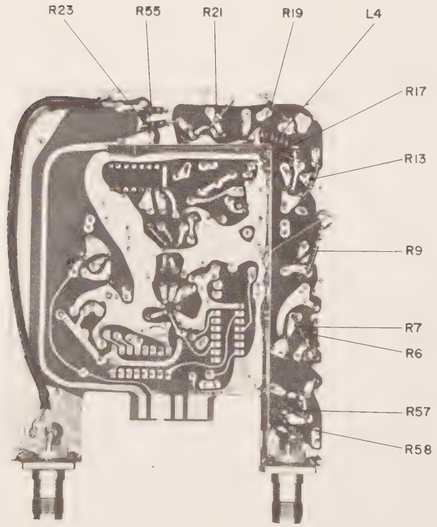
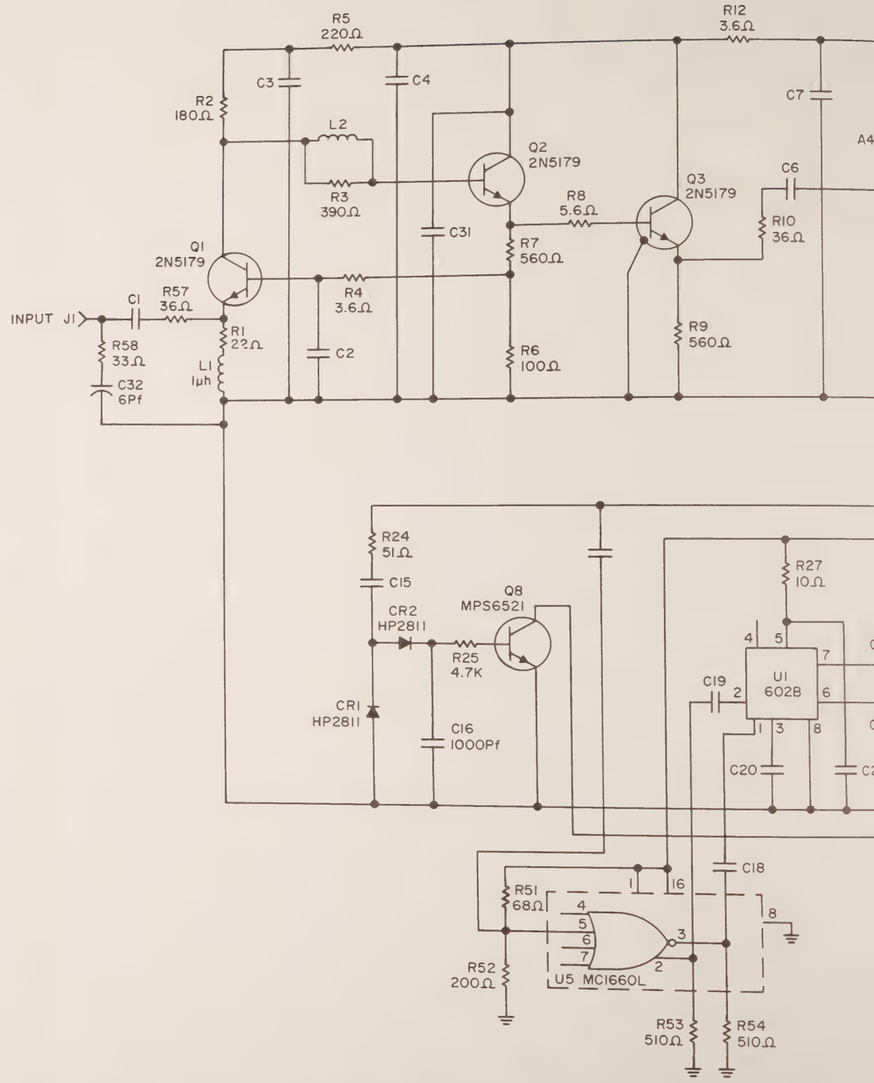


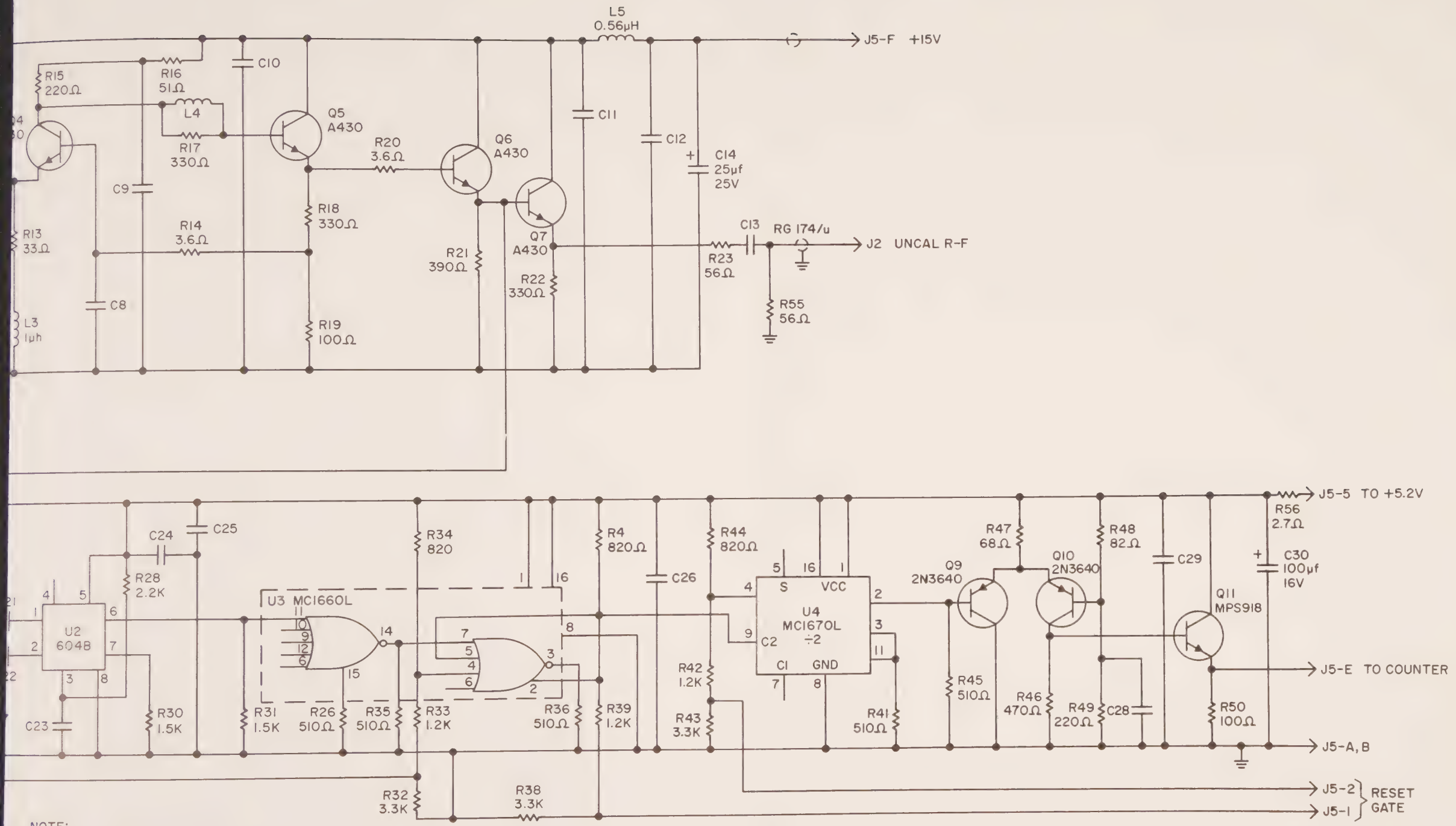
Figure 5-2. Display Assembly A1, Schematic and Parts Location Diagram


R16
R18 C10
R20 Q6 Q7
R22 C11 L5 C12
C13
C17
C9
R24
R14
R15
C15
L3
C8
Q4
C16
C6
C7
R12
R10
Q3
C31
C4
R8
R5
Q2
C3
L2
C2
R4
R2
R3
L1
C14
U5
R52
R51
R53
R54
C28
R49
R46
Q11
Q10
R43
Q9
R48
R47
R50
C30
R45
R41
R42
Q1
R1 C1
J1
R35 R38 U3 U2 C24
R31 R44
R30 R56 U4 C29 J2


Q5
CR1
CR2
R25
Q8
R32
R33
C26
R34
R37
R36
R28
R40
C18
C19
C27
C20
U1
R27
C25
C32
R39
R26
C23
C22
C21

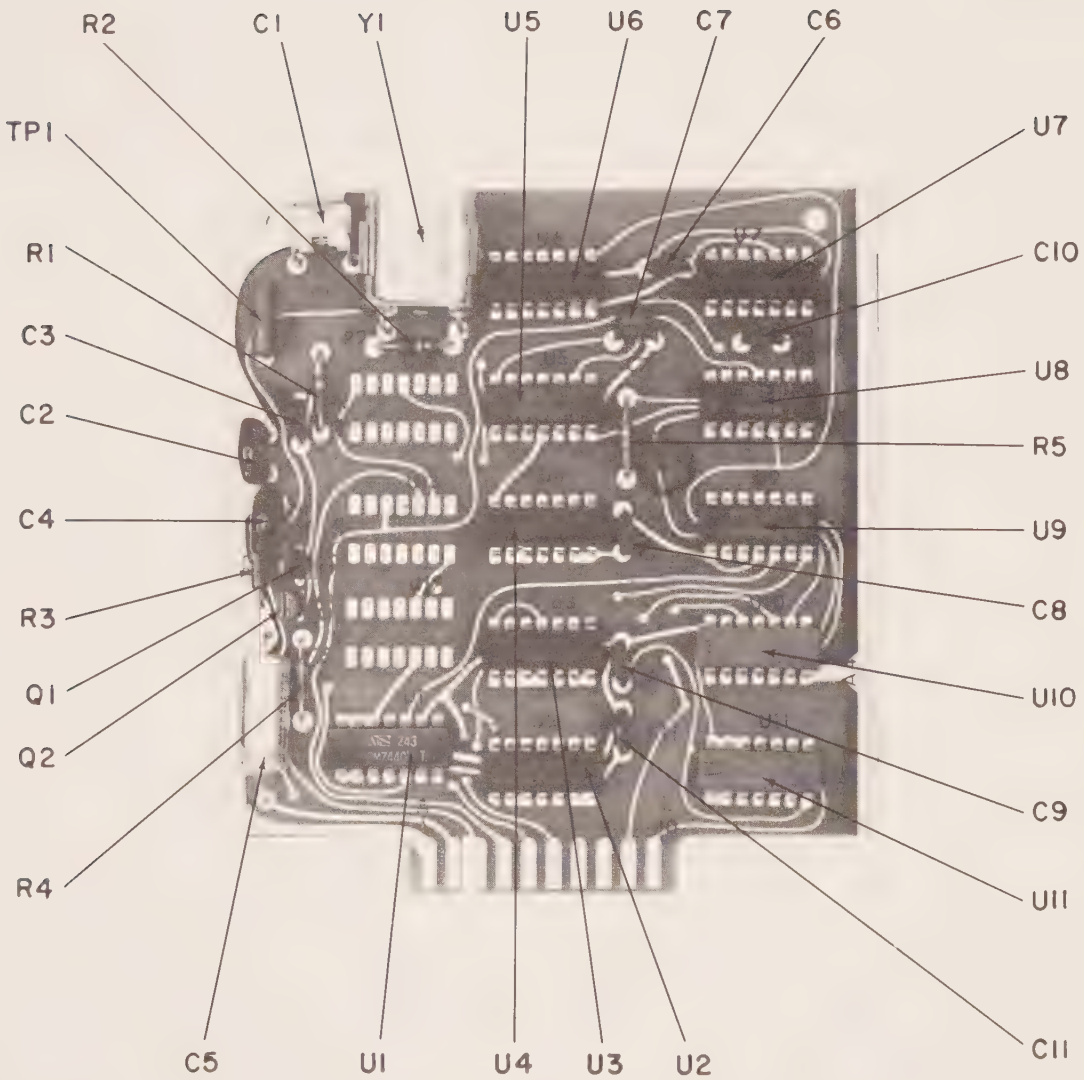

R23
R55
R21
R19
L4
R17
R13
R9
R7
R6
R57
R58


R5
220Ω
R12
3.6Ω
C3
C4
C7
R2
180Ω
L2
Q2
2N5179
R3
390Ω
Q3
2N5179
C6
R8
5.6Ω
C31
R10
36Ω
R7
560Ω
Q1
2N5179
R4
3.6Ω
INPUT J1
C1
R57
36Ω
R1
22Ω
R9
560Ω
R58
33Ω
L1
1μh
C2
R6
100Ω
C32
6Pf
R24
51Ω
C15
Q8
MPS6521
R27
10Ω
CR2
HP2811
R25
4.7K
U1
602B
C19
CR1
HP2811
C16
1000Pf
C20
C18
R51
68Ω
U5 MC1660L
R52
200Ω
R53
510Ω
R54
510Ω



NOTE:
UNLESS OTHERWISE SPECIFIED,
ALL RESISTANCE IS 1/4 WATT, 5%;
ALL UNMARKED CAPACITANCE IS 0.1uf;
ALL INDUCTANCE IS MH

Figure 5-4. Prescaler, Assembly A3, Schematic and Parts Location Diagram


R2
C1
Y1
U5
U6
C7
C6
TP1
U7
R1
C10
C3
U8
C2
R5
C4
U9
C8
R3
Q1
U10
Q2
C9
R4
U11
C11
C5
U1
U4
U3
U2

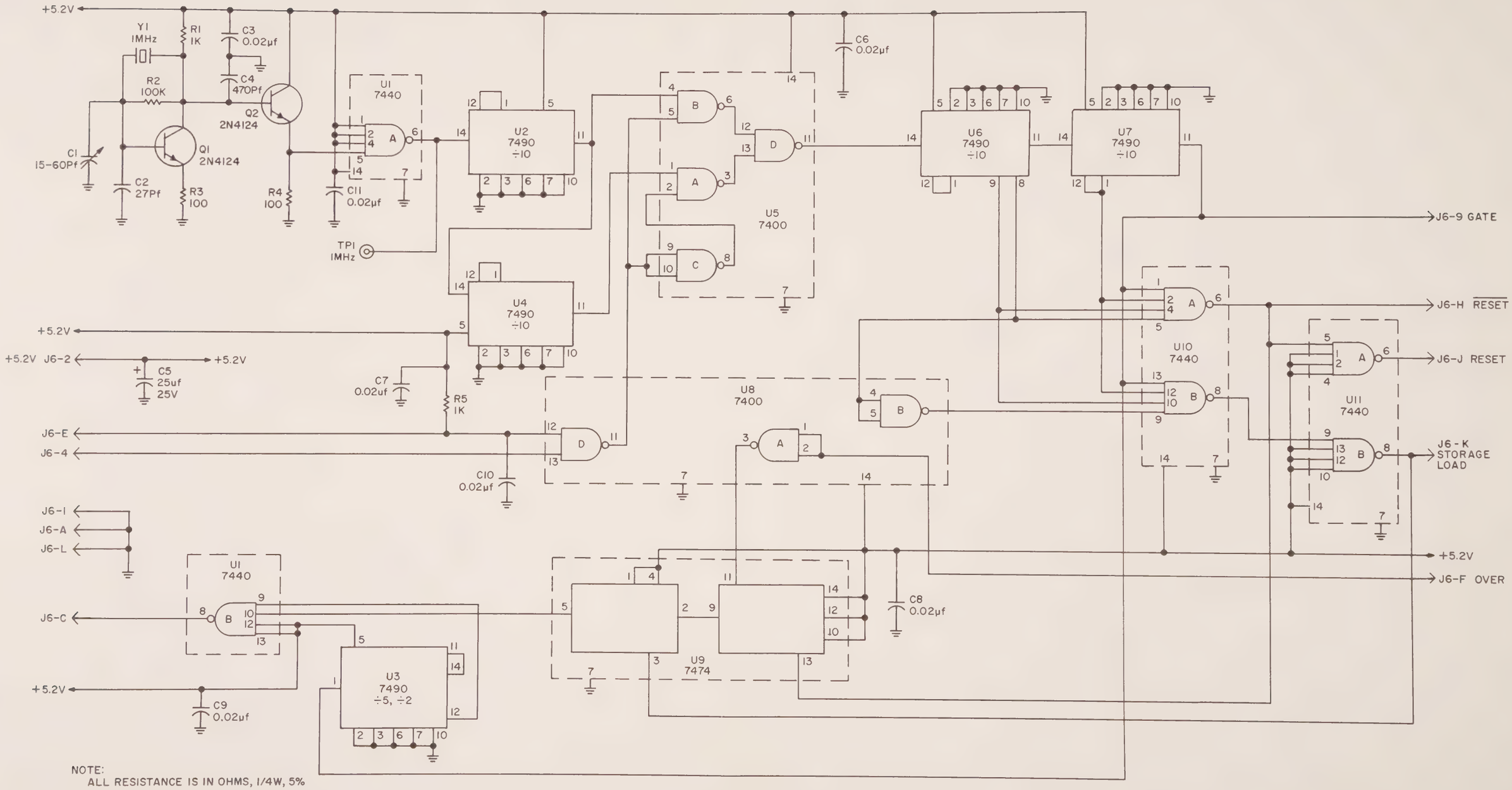
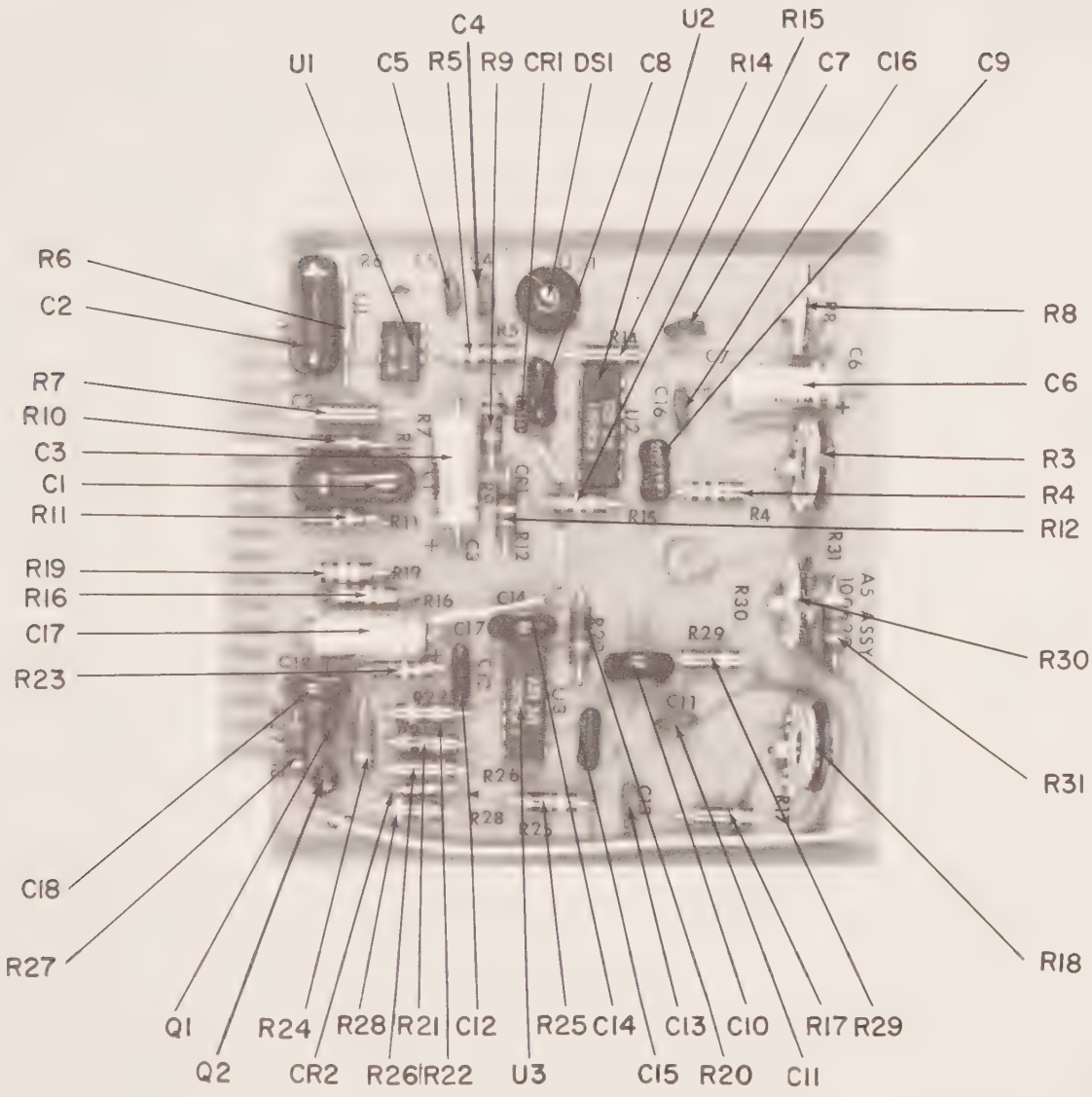
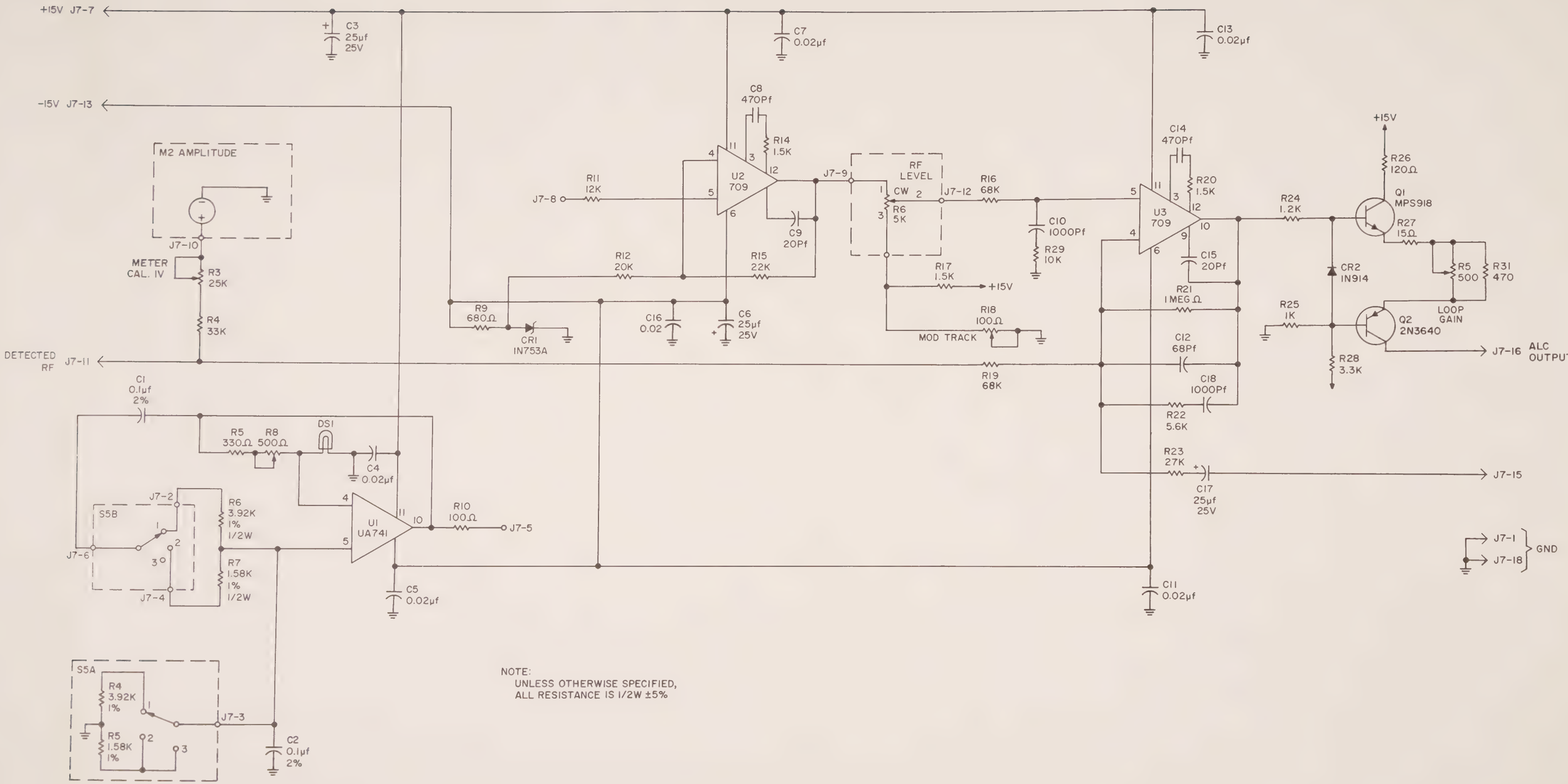


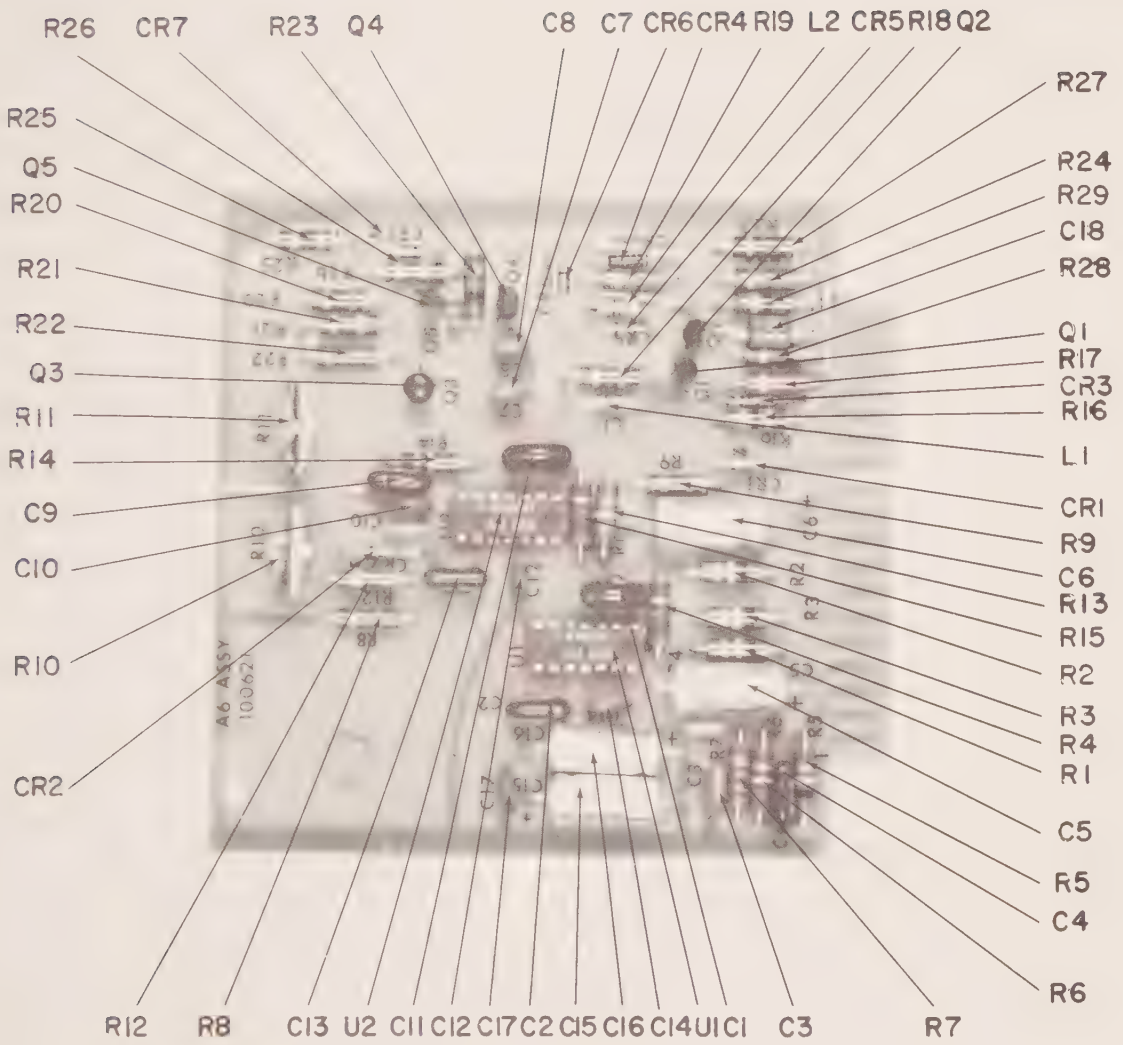
Figure 5-5. Time Base, Assembly A4, Schematic and Parts Location Diagram


C4
U2
R15
U1
C5
R5
R9
CR1
DS1
C8
R14
C7
C16
C9
R6
C2
R8
C6
R7
R10
C3
C1
R11
R3
R4
R12
R19
R16
C17
R23
R30
R31
C18
R27
R18
Q1
Q2
R24
R28
R21
C12
R25
C14
C13
C10
R17
R29
CR2
R26
R22
U3
C15
R20
C11



NOTE:
UNLESS OTHERWISE SPECIFIED,
ALL RESISTANCE IS 1/2W ±5%

Figure 5-6. AM Level, Assembly A5, Schematic and Parts Location Diagram


R26
CR7
R23
Q4
C8
C7
CR6
CR4
R19
L2
CR5
R18
Q2
R27
R25
Q5
R20
R24
R29
C18
R21
R28
R22
Q1
Q3
R17
CR3
R11
R16
R14
L1
C9
CR1
C10
R9
C6
R13
R10
R15
R2
R3
R4
CR2
R1
C5
R5
C4
R6
R12
R8
C13
U2
C11
C12
C17
C2
C15
C16
C14
U1
C1
C3
R7

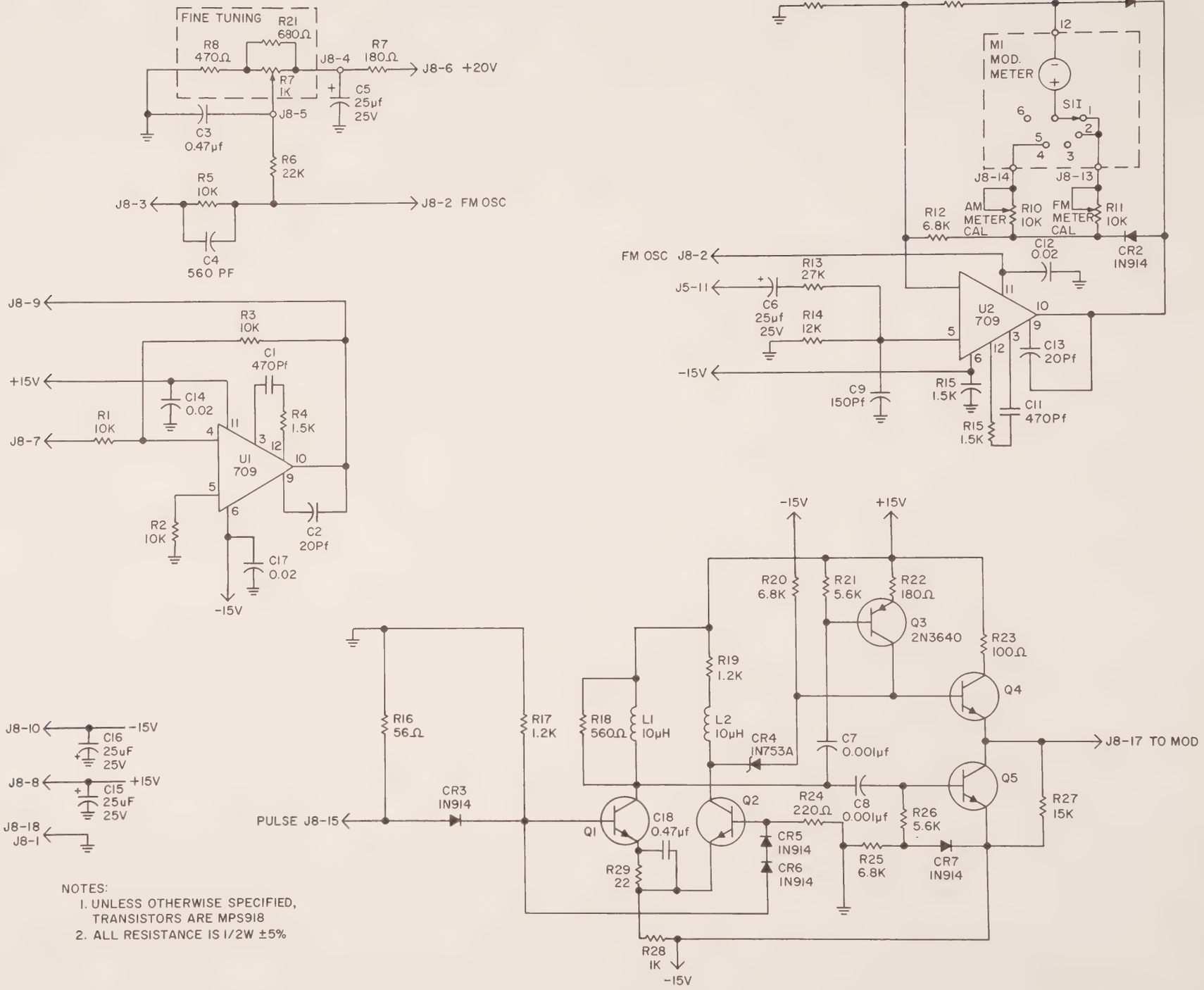
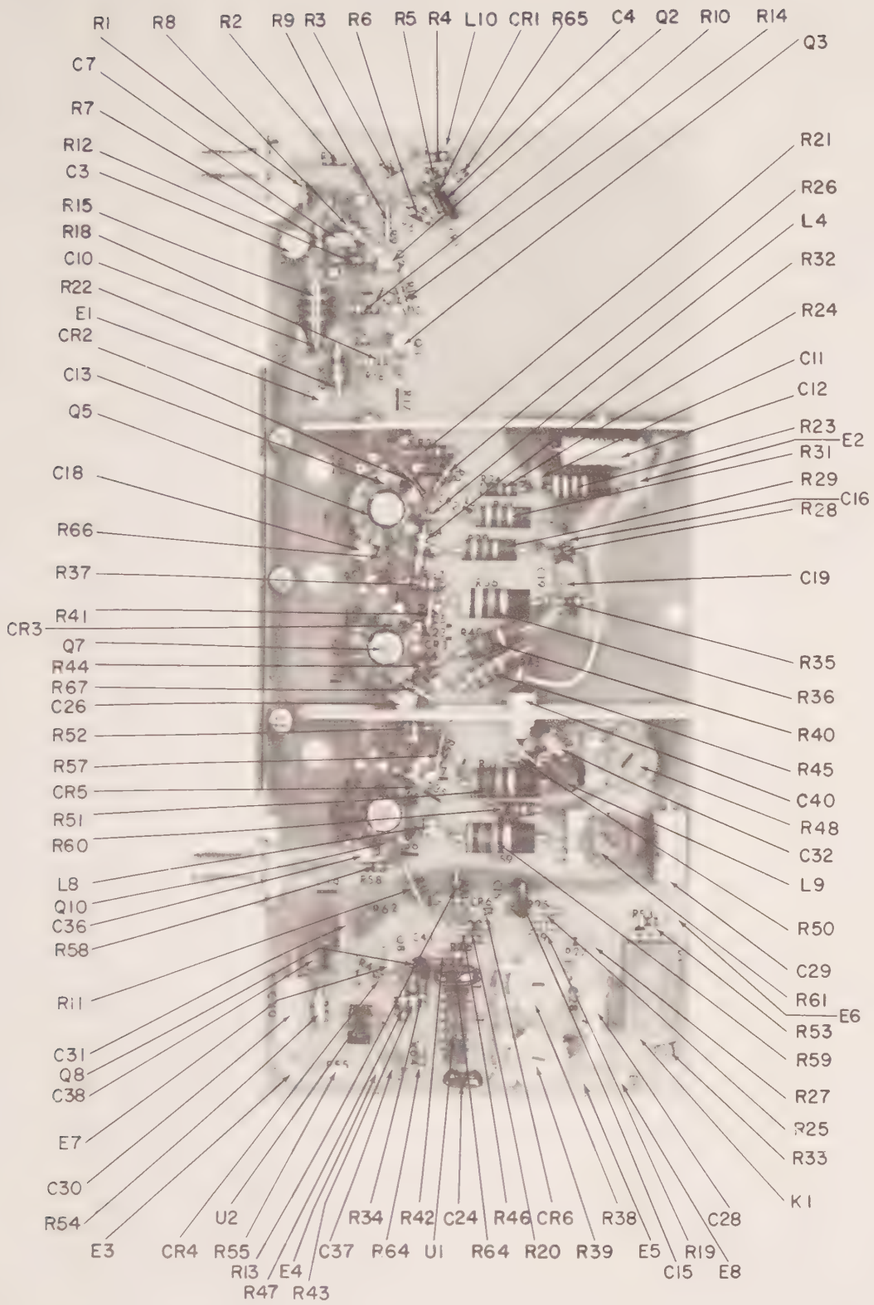
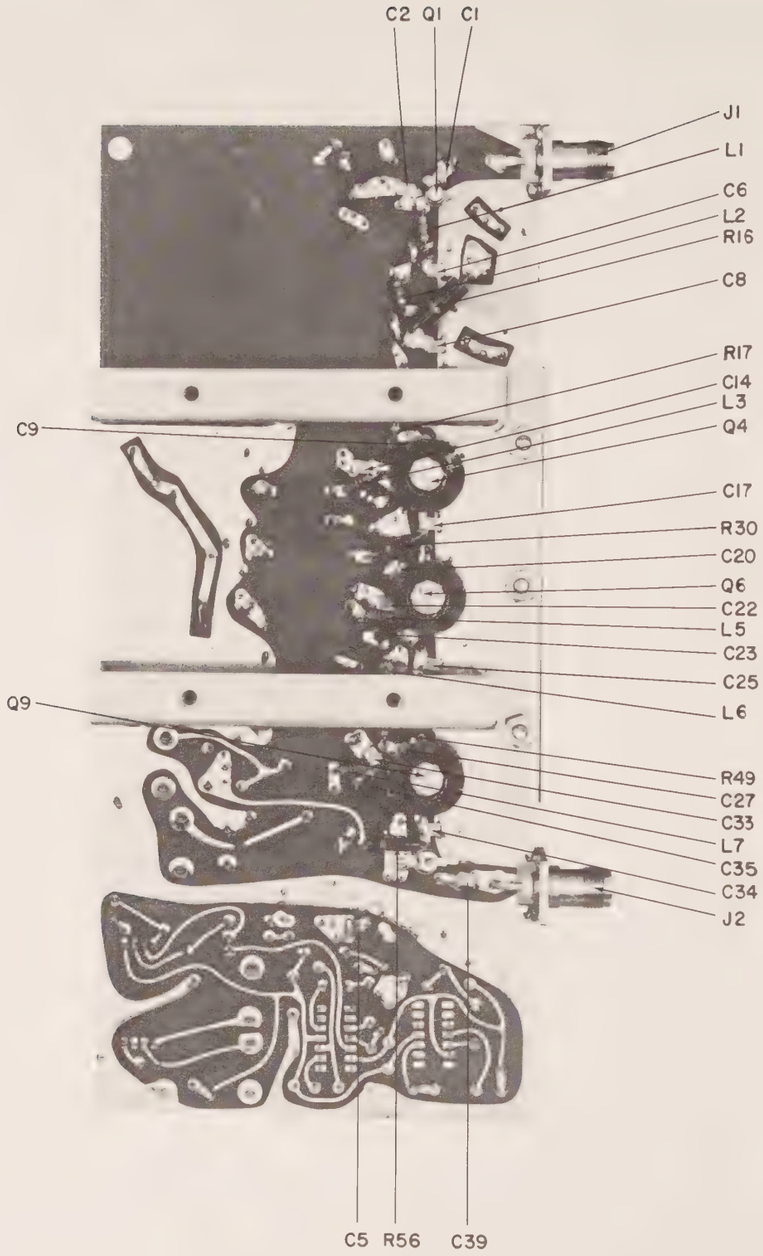


Figure 5-7. FM Pulse, Assembly A6, Schematic and Parts Location Diagram


R1
R8
R2
R9
R3
R6
R5
R4
L10
CR1
R65
C4
Q2
R10
R14
Q3
C7
R7
R12
C3
R15
R18
C10
R22
E1
CR2
C13
Q5
C18
R66
R37
CR3
R41
Q7
R44
R67
C26
R52
R57
CR5
R51
R60
L8
Q10
C36
R58
R11
C31
Q8
C38
E7
C30
R54
R21
R26
L4
R32
R24
C11
C12
R23
E2
R31
R29
C16
R28
C19
R35
R36
R40
R45
C40
R48
C32
L9
R50
C29
R61
E6
R53
R59
R27
R25
R33
K1
C28
R19
C15
E8
R38
E5
R39
R20
R64
R46
CR6
C24
U1
R64
R42
R34
C37
E4
R43
R47
R13
CR4
R55
U2
E3


C2
Q1
C1
J1
L1
C6
L2
R16
C8
R17
C14
L3
Q4
C9
C17
R30
C20
Q6
C22
L5
C23
C25
L6
Q9
R49
C27
C33
L7
C35
C34
J2
C5
R56
C39

NOTES:
1. UNLESS OTHERWISE SPECIFIED, ALL RESISTANCE IS 1/4W, 5%; ALL CAPACITANCE IS IN MICROFARADS
2. * SELECT IN TEST RESISTOR. SELECTION RANGE IS FROM 100Ω TO 470Ω. R1 VALUE (10 TO 100Ω)
3. ** SELECT IN TEST CAPACITOR, CEMENTED TO BOARD
4. *** SELECT IN TEST CAPACITOR, USED WHEN TEST DICTATES. QUALITY COMPONENTS TYPE SF6108, VALUE RANGE FROM 1-2Pf

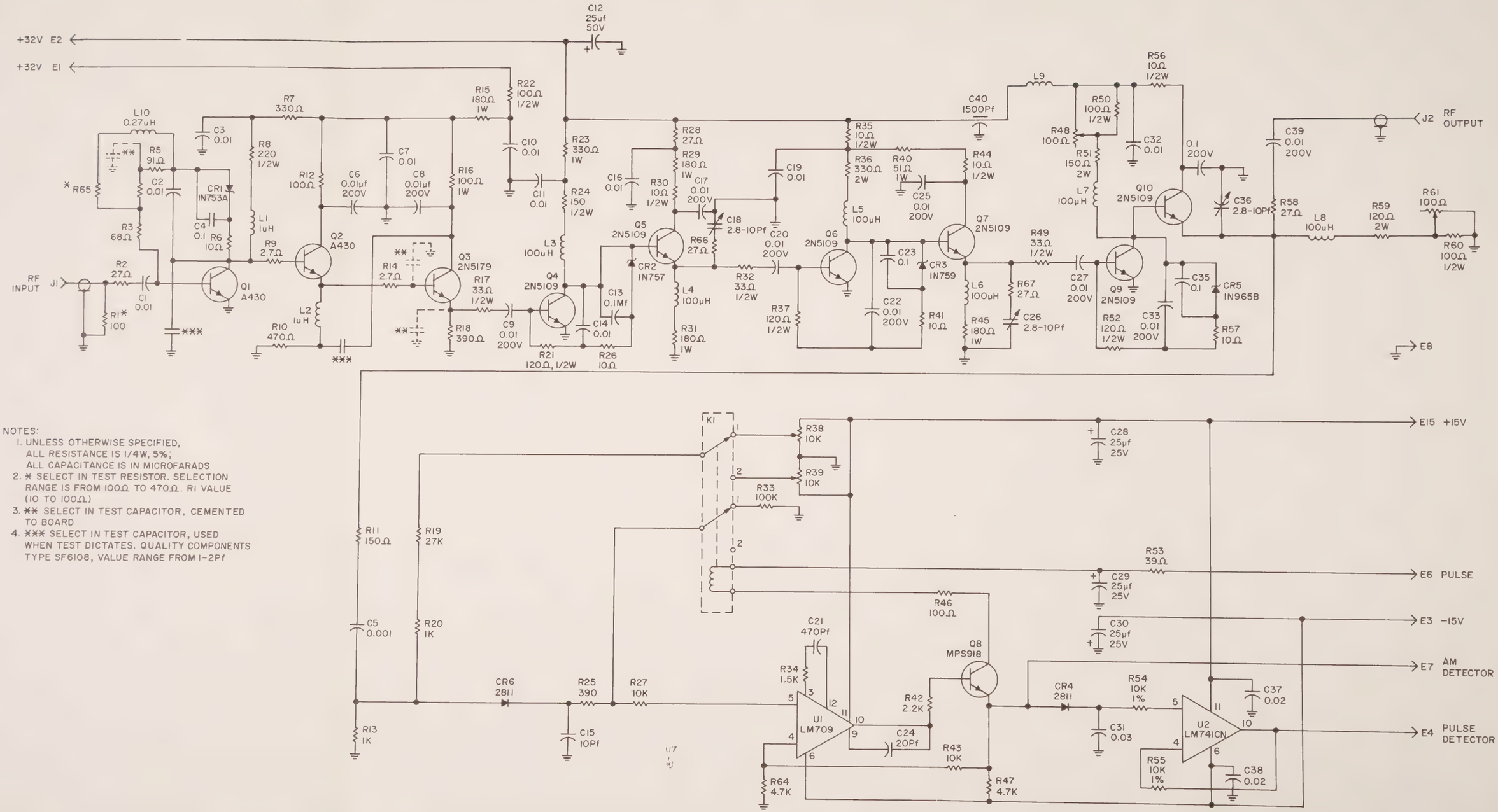
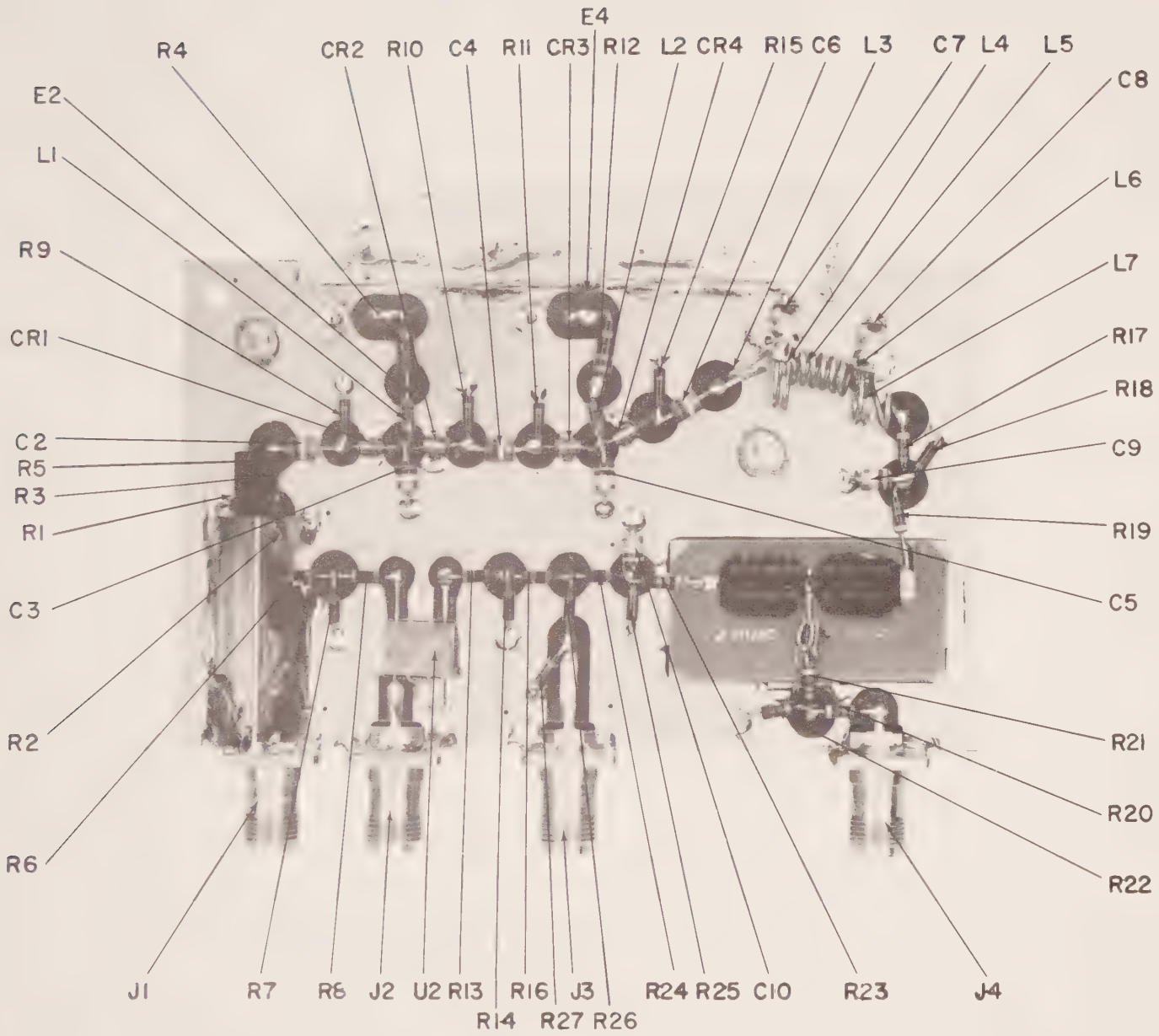
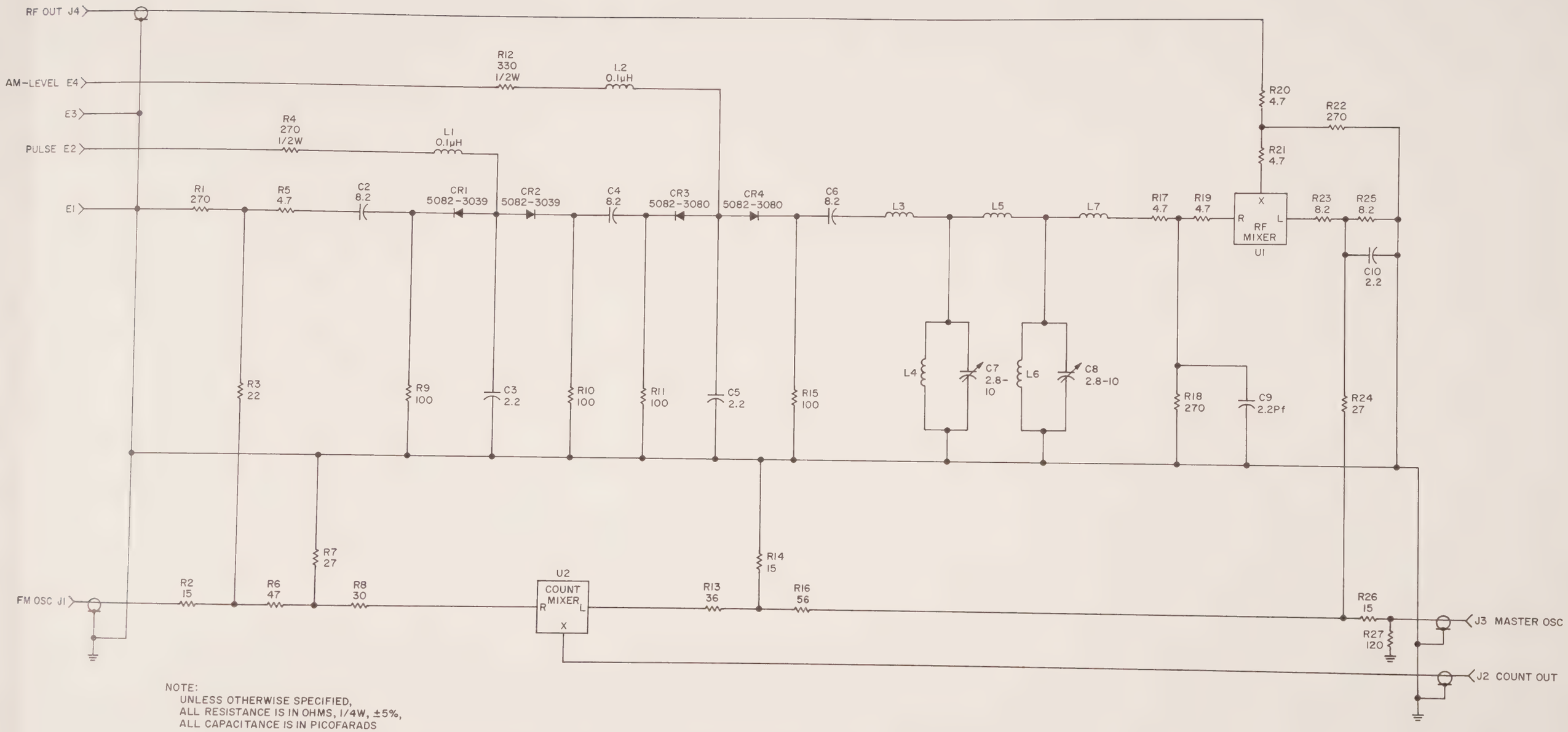


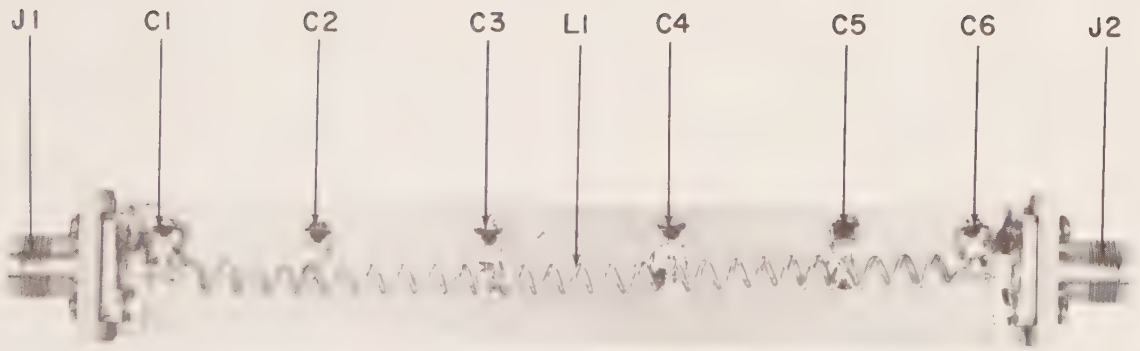
Figure 5-8. RF Amplifier, Assembly A7, Schematic and Parts Location Diagram


E4
R4
CR2
R10
C4
R11
CR3
R12
L2
CR4
R15
C6
L3
C7
L4
L5
C8
E2
L1
L6
R9
L7
CR1
R17
R18
C2
C9
R5
R3
R19
R1
C5
C3
R21
R2
R20
R6
R22
J1
R7
R8
J2
U2
R13
R16
J3
R24
R25
C10
R23
J4
R14
R27
R26



NOTE:
UNLESS OTHERWISE SPECIFIED,
ALL RESISTANCE IS IN OHMS, 1/4W, ±5%,
ALL CAPACITANCE IS IN PICOFARADS

Figure 5-9. MOD Mixer, Assembly A8, Schematic and Parts Location Diagram


J1
C1
C2
C3
L1
C4
C5
C6
J2

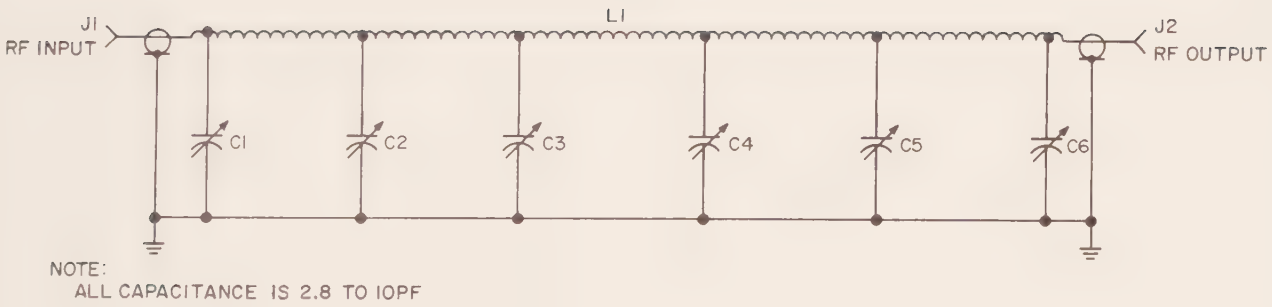
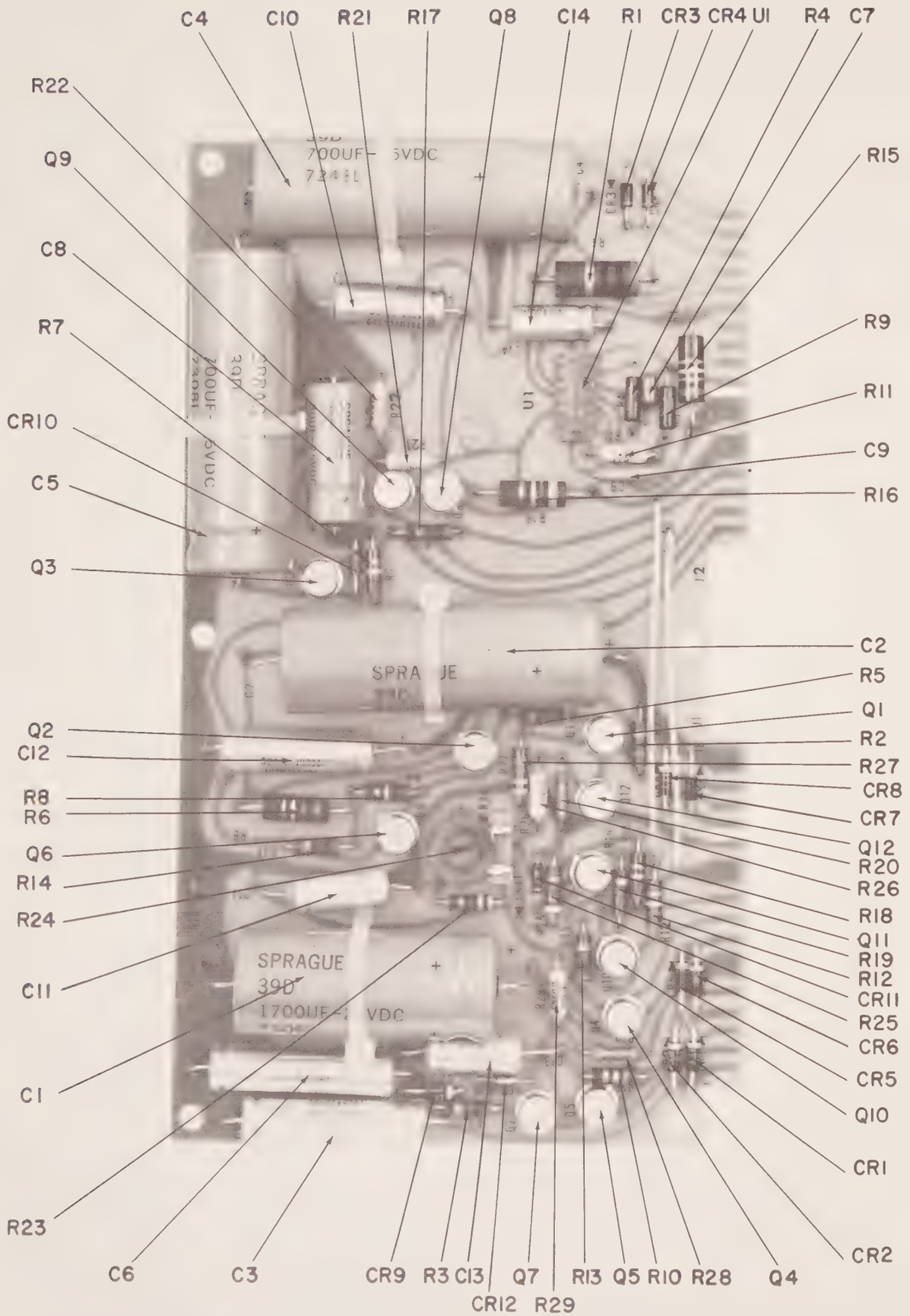


Figure 5-10. Low Pass Filter, Assembly A9, Schematic and Parts Location Diagram


C4
C10
R21
R17
Q8
C14
R1
CR3
CR4
U1
R4
C7
R22
Q9
R15
C8
R7
R9
R11
CR10
C9
C5
R16
Q3
C2
R5
Q1
Q2
C12
R2
R27
R8
CR8
R6
CR7
Q12
Q6
R20
R14
R26
R24
R18
Q11
C11
R19
R12
CR11
R25
CR6
CR5
C1
Q10
CR1
R23
CR2
C6
C3
CR9
R3
C13
Q7
R13
Q5
R10
R28
Q4
CR12
R29

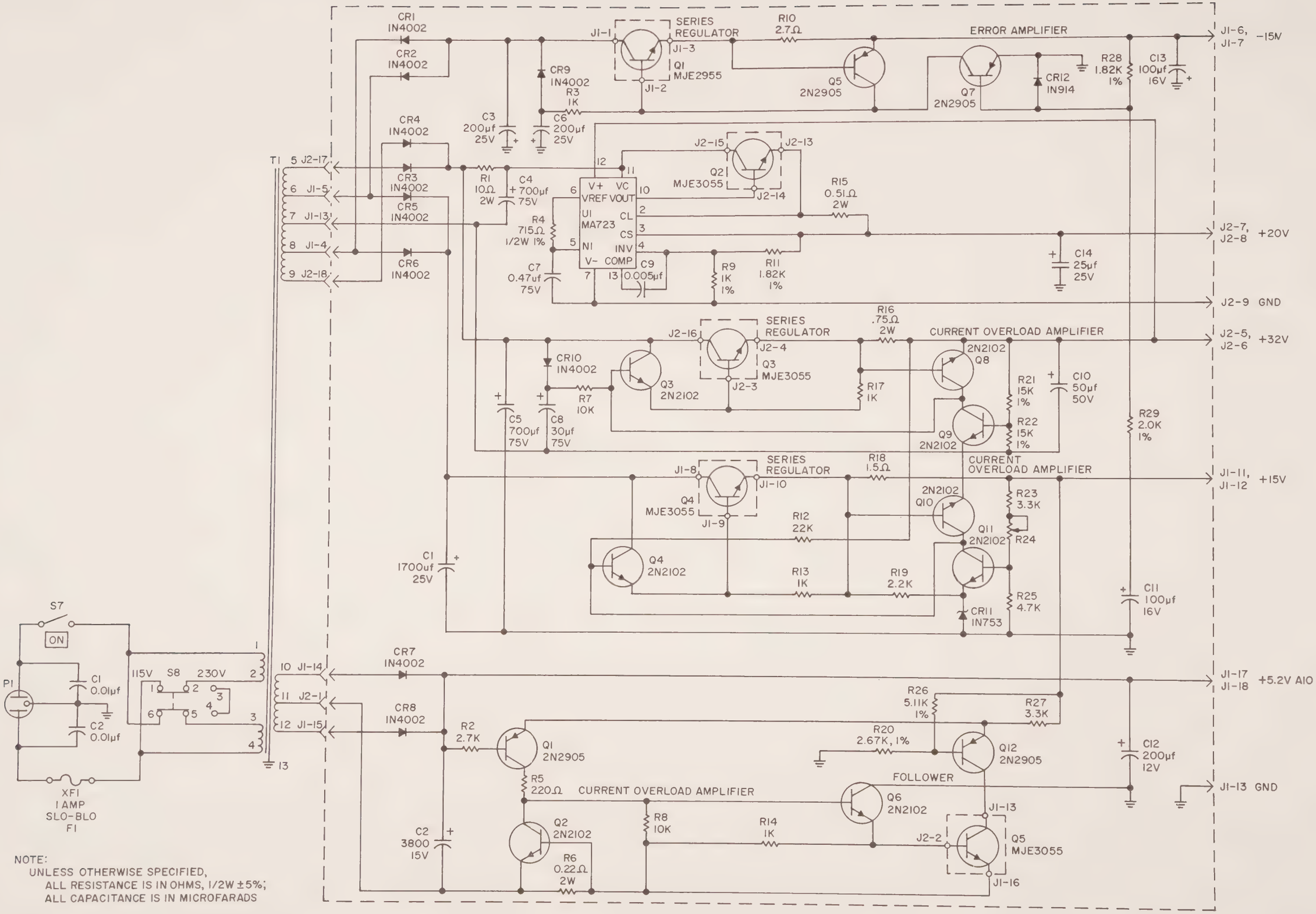
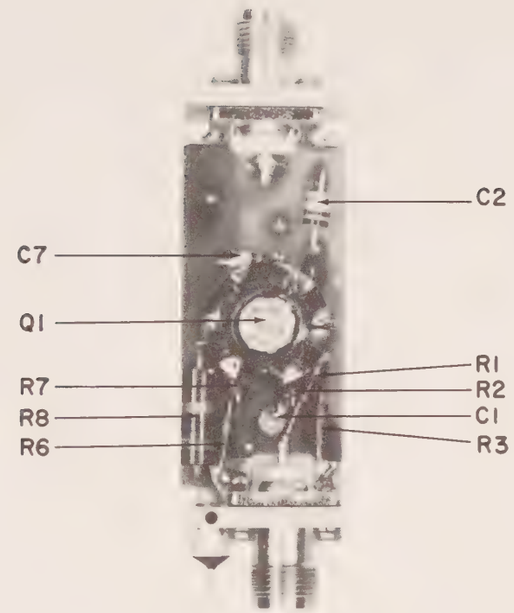
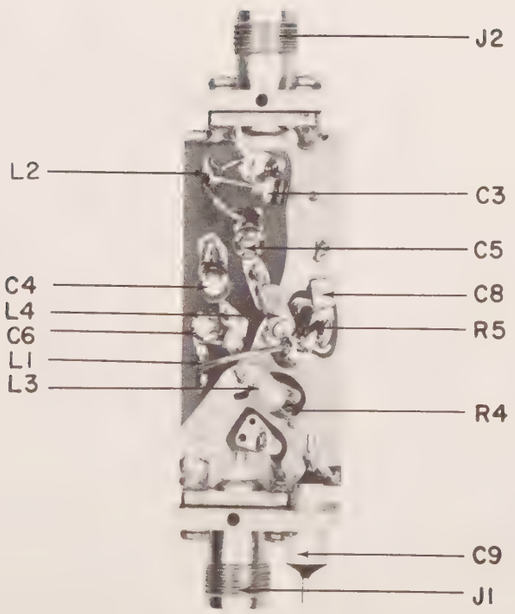
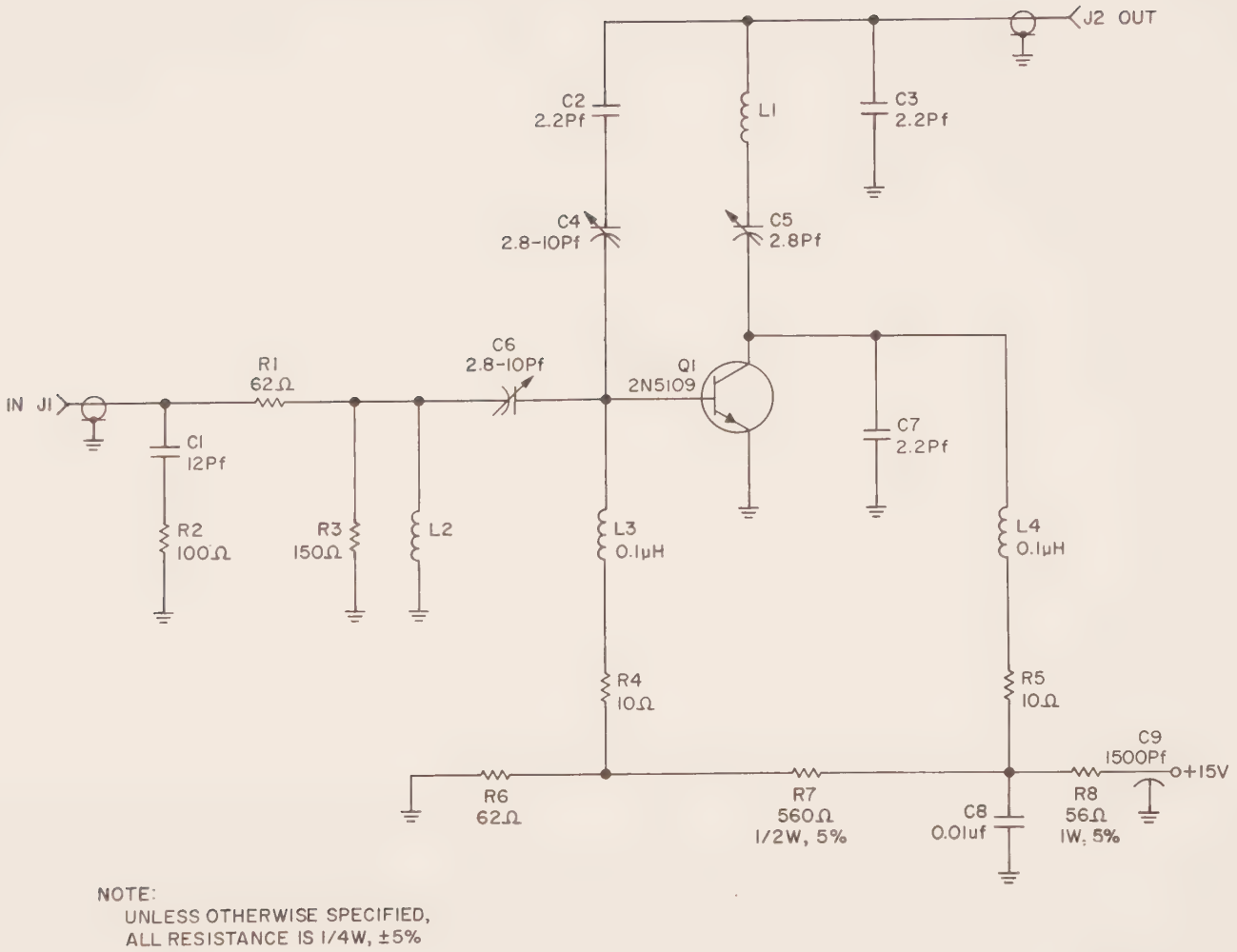


Figure 5-11. Power Supply, Assembly A10, Schematic and Parts Location Diagram


C2
C7
Q1
R1
R7
R2
R8
C1
R6
R3


J2
L2
C3
C5
C4
C8
L4
R5
C6
L1
L3
R4
C9
J1



NOTE:
UNLESS OTHERWISE SPECIFIED,
ALL RESISTANCE IS 1/4W, ±5%

Figure 5-12. Isolation Amplifier, Assembly A11, Schematic and Parts Location Diagram

SECTION VI

PARTS LIST

6–1. INTRODUCTION

6-2. This parts list provides an alpha-numerical listing, in reference symbol sequence of the replaceable electrical and certain mechanical parts of the equipment. All parts location illustrations are located in Section V adjacent to the schematic diagram of the assembly in which the part appears.

6-3. ORDERING INFORMATION. Orders for parts should contain the following information:

a. Equipment name and model

b. Serial Number

c. Reference Symbol of Part

d. Manufacturer's Part No. and Code.

6–4. HOW TO USE THE PARTS LIST

6-5. An explanation of the structure of the parts list, Table 6-2, and the meaning of the entries in the five column are given in the following paragraphs.

6-6. REFERENCE SYMBOL COLUMN. The reference symbol column contains the reference symbol assigned to each part, which also identifies the part on the schematic diagram or in an illustration. The listing is in alpha-numerical order.

6-7. DESCRIPTION COLUMN. The description column (2) contains the description for each part. When the same part is used more than once in the equipment, the second and subsequent listings for that part use the phrase "SAME AS " in the description column and the remaining columns are left blank. When a reference symbol designation has not been used or its assignment has been cancelled, the description column contains the phrase "NOT USED".

6-8. MANUFACTURER'S PART NUMBER COLUMN. The manufacturer's part number column contains the part number assigned by the manufacturer of the part, except for "SAME AS " and "NOT USED" listings.

6-9. MANUFACTURER'S CODE COLUMN. The manufacturer's code column contains a 5 digit code identifying the manufacturer of the part. Table 6-1 contains a listing of the letter codes and the manufacturer's names and addresses.

6-10. QUANTITY PER ASSEMBLY COLUMN. The total quantity of the part used in each assembly is shown in this column.

TABLE 6-1. LIST OF MANUFACTURERS

CODE	MANUFACTURER
01121	Allen Bradley Co. 1201 South 2nd St. Milwaukee, Wisc 53204
01295	Texas Instruments Inc. Semi Conductor Division 13500 North Central Expressway Dallas, Texas 75231
04713	Motorola Sem-Conductor Products 5005 East McDowell Road Phoenix, Ariz 85008
02114	Ferroxcube Corp. Sangerties, N.Y.
11678	Grigsby Barton Inc. 3800 Industrial Drive Rolling Meadows, Ill. 60008
13715	Fairchild Camera & Instrument Corp. SemiConductor Division 4300 Redwood Highway San Rafael, Calif. 94902
22753	UID Electronics Corp. 4105 Pembroke Rd. Hollywood, Fla. 33021
24931	Specialty Connector Corp. 3560 Madison Ave. Indianapolis, Ind. 46227
28480	Hewlett-Packard Co. 1501 Page Mill Road Palo Alto, Calif. 94304
31356	JBT Instruments Inc. 424 Chapel St. New Haven, Conn. 06508
33013	Logimetrics Inc. 100 Forest Drive Greenvale, N.Y. 11548
33095	Spectrum Control Fairview, Pa. 16415
44655	Ohmite Mfg Co. 3601 W. Howard St. Skokie, Ill. 60076
56289	Sprague Electric Co. North Adams, Mass. 01247
71450	CTS Corp. 1142 W. Beardsley Ave. Elkhart, Inc. 46514
71590	Centralab Div. of Globe Union, Inc. Milwaukee, Wisc. 53201
71744	Chicago Miniature Lamp Works 4433 Ravenswood Ave. Chicago, Ill. 60640
72136	Electro Motive Mfg Co. Inc. South Park and John Streets Willimantic, Conn. 06226
72259	Nytronics Inc. Orange St. Darlington, S.C. 29532
72982	Erie Technological Products, Inc. 644 W. 12th St. Erie, Pa. 16512
73445	Amperex Elec. Hicksville, N.Y. 11802
75042	IRC Div. of TRW Inc. 401 North Broad St. Philadelphia, Pa. 19108
75915	Littelfuse Inc. 300 E. Northwest Hwy Des Plaines, Ill. 60016
76854	Oak Mfg. Co. S. Main Crystal Lake, Ill. 60014
80294	Bourns Inc. 1200 Columbia Ave. Riverside, Calif. 92507
81349	Military Specifications
83330	H.H. Smith Brooklyn, N.Y. 11207
91293	Johnson Mfg. Co. Boonton, N.J.
91418	Radio Materials Co. Chicago, Ill. 60646
91506	Augat Inc. 33 Perry Ave. Attleboro, Mass 02703
95121	Quality Components Inc. P.O. Box 113 St. Mary's, Pa. 15857

TABLE 6-2. PARTS LIST

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	MAIN ASSY (A12)			
AT1	ATTENUATOR	100502	33013	1
A1	DISPLAY BOARD ASSY	100622	33013	1
A2	COUNTER BOARD ASSY	100619	33013	1
A3	PRESCALER BOARD ASSY	100632	33013	1
A4	TIME BASE BOARD ASSY	100634	33013	1
A5	AM BOARD ASSY	100620	33013	1
A6	FM BOARD ASSY	100621	33013	1
A7	RF AMP BOARD ASSY	100623	33013	1
A8	MOD MIXER BOARD ASSY	100628	33013	1
A9	FILTER ASSY	100655	33013	1
A10	POWER SUPPLY BOARD ASSY	100633	33013	1
A11	ISOLATION AMP ASSY	100659	33013	1
C1, C2	CAPACITOR, FIXED, CERAMIC, .01 UF, 1 KV	DD103	71590	2
C3, C4	CAPACITOR, FIXED, CERAMIC, .47 UF	8131-050-651-474M	72982	4
C5-C7	CAPACITOR, FEEDTHRU, 1500 PF	2499-003-X550-152M	72982	3
C8	CAPACITOR, FILTER	51-714-002	33095	6
C9	CAPACITOR, FEEDTHRU, 100 PF	2425-001-15U0-101AA	72982	2
C10	SAME AS C8			
C11	SAME AS C9			
C12, C15	SAME AS C8			
C16, C17	SAME AS C4			
F1	FUSE, LAMP, SLO-BLO, 1 AMP	F-MDL-1	75915	1
J9, J10	CONNECTOR	28JR124-2	24931	2
J11-J13	CONNECTOR	28JR103-1	24931	3
M1	METER, MODULATION	100507	33013	1
M2	METER, AMPLITUDE	100506	33013	1
Q1	TRANSISTOR	MJE2955	04713	1
Q2-Q5	TRANSISTOR	MJE3055	04713	4
R1	RESISTOR, FIXED, COMPOSITION, 100K, 5%	RC20GF104J	81349	1

TABLE 6-2. PARTS LIST (Continued)

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	MAIN ASSY (A12) (Continued)			
R2, R3	RESISTOR, VARIABLE, 2.5K	RMU2521	44655	2
R4	RESISTOR, FIXED, FILM, 3.92K, 1/2W, 1%	RN60GF3921F	81349	1
R5	RESISTOR, FIXED, FILM, 1.58K, 1%	RN60C1581F	81349	1
R6	RESISTOR, VARIABLE, 5K	CMU502-OHMITE	44655	1
R7	RESISTOR, VARIABLE, 1K	3507S1102	80294	1
R8	RESISTOR, FIXED, COMPOSITION, 470 OHMS, 1/2W, 5%	RC20GF471J	81349	1
R9	RESISTOR, FIXED, COMPOSITION, 560 OHMS, 1/2W, 5%	RC20GF561J	81349	1
R10	RESISTOR, FIXED, FILM, 953 OHMS, 1%	RN60D9530F	81349	1
R11	RESISTOR, FIXED, FILM, 499 OHMS, 1%	RN60D4990F	81349	1
R12	RESISTOR, FIXED, FILM, 715 OHMS, 1%	RN60D7150F	81349	4
R13, R14	RESISTOR, FIXED, FILM, 487 OHMS, 1%	RN60D4870F	81349	3
R15	SAME AS R12			
R16	SAME AS R13			
R17, R18	SAME AS R13			
R19	RESISTOR, FIXED, FILM, 332 OHMS, 1%	RN60D3320F	81349	1
R20	RESISTOR, FIXED, FILM, 249 OHMS, 1%	RN60D2490F	81349	1
R21	RESISTOR, FIXED, COMPOSITION, 680 OHMS, 1/2W, 5%	RC20GF681J	81349	1
S1	SWITCH, MOD	100597	33013	1
S2	SWITCH, DEVIATION	100596	33013	1
S3	SWITCH, METER	422	22753	1
S4	SWITCH, LEVER	3991-63-184	76854	2
S5	SAME AS S4			
S6	NOT USED			
S7	SWITCH, ON/OFF	15-123	31356	1
S8	SWITCH, 115/230V	100407	33013	1
T1	TRANSFORMER	100476	33013	1
XF1	FUSEHOLDER	HKP	71400	1
Y1	OSCILLATOR, MASTER	100504	33013	1
Y2	OSCILLATOR, FM	100503	33013	1

TABLE 6-2. PARTS LIST (Continued)

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	DISPLAY BOARD (A1)			
C1-C4	CAPACITOR, FIXED, CERAMIC, .02 UF	5835-000-Y5U-203Z	72982	4
C5	CAPACITOR, FIXED, ELECTROLYTIC, 25 UF, 25V	30DTE-1207	56289	1
DS1-DS5	DISPLAY, LED	5082-730	28480	5
DS6	DISPLAY, LED	5082-4403	28480	1
R1	RESISTOR, FIXED, COMPOSITION, 120 OHMS, 1/4W, 5%	RC07GF121J	81349	1
R2, R3	RESISTOR, FIXED, COMPOSITION, 1K, 1/4W, 5%	RC07GF102J	81349	2
	DIGITAL COUNTER (A2)			
C1	CAPACITOR, FIXED, ELECTROLYTIC, 25 UF, 25V	30DTE1207	56289	1
C2-C10	CAPACITOR, FIXED, CERAMIC, .02 UF	5835-000-Y5U-203Z	72982	9
R1	RESISTOR, FIXED, COMPOSITION, .1K, 1/4W, ±5%	RC07GF102J	81349	1
U1, U2	INTEGRATED CIRCUIT	74H102	01295	2
U3	INTEGRATED CIRCUIT	74S112	01295	4
U4-U7	INTEGRATED CIRCUIT	SN7490N	01295	4
U8-U12	INTEGRATED CIRCUIT	SN7475N	01295	5
	PRESCALER (A3)			
CR1, CR2	DIODE	HP2811	28480	2
C1-C13	CAPACITOR, FIXED, CERAMIC, .1 UF	8131-100-651-104M	72982	27
C14	CAPACITOR, FIXED, ELECTROLYTIC, 25 UF, 25V	30DTE1207	56289	1
C15	SAME AS C1			
C16	CAPACITOR, FIXED, MICA, 1000 PF	DM-15-102J	72136	1
C17-C29	SAME AS C1			
C30	CAPACITOR, FIXED, ELECTROLYTIC, 100 UF, 16V	39D107G016DC4	52289	1
C31	SAME AS C1			
C32	CAPACITOR, FIXED, MICA, 6 PF	DM-15-060D	72136	1
J1, J2	CONNECTOR	24JR124-1	24931	2
L1	COIL, RF, 1 UH	DECI-DUCTOR 1.0	72259	2
L2	COIL, RF	100630	33013	1
L3	SAME AS L1			

TABLE 6-2. PARTS LIST (Continued)

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	PRESCALER (A3) (Continued)			
L4	COIL, RF	100631	33013	1
L5	COIL, RF, 0.56 UH	WEE-DUCTOR .56	72259	1
Q1-Q3	TRANSISTOR	2N5179	81349	3
Q4-Q7	TRANSISTOR	A430	73445	4
Q8	TRANSISTOR	MPS6521	04713	1
Q9, Q10	TRANSISTOR	2N3640	81349	2
Q11	TRANSISTOR	MPS918	04713	1
R1	RESISTOR, FIXED, COMPOSITION, 22 OHMS, 1/4W, 5%	RC07GF220J	81349	1
R2	RESISTOR, FIXED, COMPOSITION, 180 OHMS, 1/4W, 5%	RC07GF281J	81349	1
R3	RESISTOR, FIXED, COMPOSITION, 390 OHMS, 1/4W, 5%	RC07GF391J	81349	2
R4	RESISTOR, FIXED, COMPOSITION, 3.6 OHMS, 1/4W, 5%	RC07GF3R6J	81349	4
R5	RESISTOR, FIXED, COMPOSITION, 220 OHMS, 1/4W, 5%	RC07GF221J	81349	3
R6	RESISTOR, FIXED, COMPOSITION, 100 OHMS, 1/4W, 5%	RC07GF101J	81349	3
R7	RESISTOR, FIXED, COMPOSITION, 560 OHMS, 1/4W, 5%	RC07GF561J	81349	2
R8	RESISTOR, FIXED, COMPOSITION, 5.6 OHMS, 1/4W, 5%	RC07GF5R6J	81349	1
R9	SAME AS R7			
R10	RESISTOR, FIXED, COMPOSITION, 36 OHMS, 1/4W, 5%	RC07GF360J	81349	2
R11	NOT USED			
R12	SAME AS R4			
R13	RESISTOR, FIXED, COMPOSITION, 33 OHMS, 1/4W, 5%	RC07GF330J	81349	2
R14	SAME AS R4			
R15	SAME AS R5			
R16	RESISTOR, FIXED, COMPOSITION, 51 OHMS, 1/4W, 5%	RC07GF510J	81349	2
R17	SAME AS R18			
R18	RESISTOR, FIXED, COMPOSITION, 330 OHMS, 1/4W, 5%	RC07GF331J	81349	3
R19	SAME AS R6			
R20	SAME AS R4			
R21	SAME AS R3			
R22	SAME AS R18			

TABLE 6-2. PARTS LIST (Continued)

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	PRESCALER (A3) (Continued)			
R23	RESISTOR, FIXED, COMPOSITION, 56 OHMS, 1/4W, 5%	RC07GF560J	81349	2
R24	SAME AS R16			
R25	RESISTOR, FIXED, COMPOSITION, 4.7 OHMS, 1/4W, 5%	RC07GF4R7J	81349	1
R26	RESISTOR, FIXED, COMPOSITION, 510 OHMS, 1/4W, 5%	RC07GF511J	81349	8
R27	RESISTOR, FIXED, COMPOSITION, 10 OHMS, 1/4W, 5%	RC07GF100J	81349	1
R28	RESISTOR, FIXED, COMPOSITION, 2.2K, 1/4W, 5%	RC07GF222J	81349	1
R29	NOT USED			
R30, R31	RESISTOR, FIXED, COMPOSITION, 1.5K, 1/4W, 5%	RC07GF152J	81349	2
R32	RESISTOR, FIXED, COMPOSITION, 3.3K, 1/4W, 5%	RC07GF332J	81349	3
R33	RESISTOR, FIXED, COMPOSITION, 1.2K, 1/4W, 5%	RC07GF122J	81349	3
R34	RESISTOR, FIXED, COMPOSITION, 820 OHMS, 1/4W, 5%	RC07GF821J	81349	3
R35, R37	SAME AS R26			
R38	SAME AS R32			
R39	SAME AS R33			
R40	SAME AS R34			
R41	SAME AS R26			
R42	SAME AS R33			
R43	SAME AS R32			
R44	SAME AS R34			
R45	SAME AS R26			
R46	RESISTOR, FIXED, COMPOSITION, 470 OHMS, 1/4W, 5%	RC07GF471J	81349	1
R47	RESISTOR, FIXED, COMPOSITION, 68 OHMS, 1/4W, 5%	RC07GF680J	81349	2
R48	RESISTOR, FIXED, COMPOSITION, 82 OHMS, 1/4W, 5%	RC07GF820J	81349	1
R49	SAME AS R5			
R50	SAME AS R6			
R51	SAME AS R47			
R52	RESISTOR, FIXED, COMPOSITION, 200 OHMS, 1/4W, 5%	RC07GF201J	81349	1
R53, R54	SAME AS R26			
R55	SAME AS R23			

TABLE 6-2. PARTS LIST (Continued)

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	PRESCALEER (A3) (Continued)			
R56	RESISTOR, FIXED, COMPOSITION, 2.7 OHMS, 1/4W, 5%	RC07GF2R7J	81349	1
R57	SAME AS R10			
R58	SAME AS R13			
	TIME BASE BOARD (A4)			
C1	CAPACITOR, VARIABLE, 15-60 PF	538-006F-1560	72982	1
C2	CAPACITOR, FIXED, MICA, 27 PF	DM-15-270J	72136	1
C3	CAPACITOR, FIXED, CERAMIC, .02 UF	5835-000-Y5U-203Z	72982	7
C4	CAPACITOR, FIXED, MICA, 470 PF	DM-15-471J	72136	1
C5	CAPACITOR, FIXED, ELECTROLYTIC, 25 UF, 25V	30DTE1207	56289	1
C6-C11	SAME AS C3			
Q1, Q2	TRANSISTOR	2N4124	81349	2
R1	RESISTOR, FIXED, COMPOSITION, 1K, 1/4W, 5%	RC07GF102J	81349	2
R2	RESISTOR, FIXED, COMPOSITION, 100K, 1/4W, 5%	RC07GF104J	81349	1
R3, R4	RESISTOR, FIXED, COMPOSITION, 100 OHMS, 1/4W, 5%	RC07GF101J	81349	2
R5	SAME AS R1			
TP1	JACK TEST	498	22753	1
U1	INTEGRATED CIRCUIT	SN7440N	01295	3
U2-U4	INTEGRATED CIRCUIT	SN7490N	01295	5
U5	INTEGRATED CIRCUIT	SN7400N	01295	2
U6, U7	SAME AS U2			
U8	SAME AS U5			
U9	INTEGRATED CIRCUIT	SN7474N	01295	1
U10, U11	SAME AS U1			
Y1	CRYSTAL	100145	33013	1

TABLE 6-2. PARTS LIST (Continued)

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	AM LEVEL (A5)			
CR1	DIODE	1N753A	81349	1
CR2	DIODE	1N914	81349	1
C1, C2	CAPACITOR, FIXED, CERAMIC, .1 UF, ±2%	IMD-2-104	72136	2
C3	CAPACITOR, FIXED, ELECTROLYTIC, 25 UF, 25V	30DTE-1207	56289	3
C4-C5	CAPACITOR, FIXED, CERAMIC, .02 UF	5830-000-Y5U-203Z	72982	6
C6	SAME AS C3			
C7	SAME AS C4			
C8	CAPACITOR, FIXED, MICA, 470 PF, 500V	DM-15471J	72136	2
C9	CAPACITOR, FIXED, MICA, 20 PF	DM-15-200J	72136	2
C10	CAPACITOR, FIXED, MICA, 1000 PF	DM-15-102J	72136	2
C11	SAME AS C4			
C12	CAPACITOR, FIXED, MICA, 68 PF	DM-15-680J	72136	1
C13	SAME AS C4			
C14	SAME AS C8			
C15	SAME AS C9			
C16	SAME AS C4			
C17	SAME AS C3			
C18	SAME AS C10			
DS1	LAMP	1869	71744	1
Q1	TRANSISTOR	MPS918	04713	1
Q2	TRANSISTOR	MPS3640	04713	1
R1-R2	NOT USED			
R3	RESISTOR, VARIABLE, 25K	X201R253B	71450	1
R4	RESISTOR, FIXED, COMPOSITION, 33K, 1/2W, 5%	RC20GF333J	81349	1
R5	RESISTOR, FIXED, COMPOSITION, 330 OHMS, 1/2W, 5%	RC20GF331J	81349	1
R6	RESISTOR, FIXED, FILM, 3.92K, 1/2W, 1%	RN60D3921F	81349	1
R7	RESISTOR, FIXED, FILM, 1.58K, 1/2W, 1%	RN60C1581F	81349	1
R8	RESISTOR, VARIABLE, 500 OHMS	X201R501B	71450	2
R9	RESISTOR, FIXED, COMPOSITION, 680 OHMS, 1/2W, 5%	RC20GF681J	81349	1
R10	RESISTOR, FIXED, COMPOSITION, 100 OHMS, 1/2W, 5%	RC20GF101J	81349	1

TABLE 6-2. PARTS LIST (Continued)

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	AM LEVEL (A5) (Continued)			
R11	RESISTOR, FIXED, COMPOSITION, 12K, 1/2W, 5%	RC20GF123J	81349	1
R12	RESISTOR, FIXED, COMPOSITION, 20K, 1/2W, 5%	RC20GF203J	81349	1
R13	NOT USED			
R14	RESISTOR, FIXED, COMPOSITION, 1.5K, 1/2W, 5%	RC20GF152J	81349	3
R15	RESISTOR, FIXED, COMPOSITION, 2.2K, 1/2W, 5%	RC20GF223J	81349	1
R16	RESISTOR, FIXED, COMPOSITION, 68K, 1/2W, 5%	RC20GF683J	81349	2
R17	SAME AS R14			
R18	RESISTOR, VARIABLE, 100 OHMS	X201R101B	81349	1
R19	SAME AS R16			
R20	SAME AS R14			
R21	RESISTOR, FIXED, COMPOSITION, 1 MEG, 1/2W, 5%	RC20GF105J	81349	1
R22	RESISTOR, FIXED, COMPOSITION, 5.6K, 1/2W, 5%	RC20GF562J	81349	1
R23	RESISTOR, FIXED, COMPOSITION, 27K, 1/2W, 5%	RC20GF273J	81349	1
R24	RESISTOR, FIXED, COMPOSITION, 1.2K, 1/2W, 5%	RC20GF122J	81349	1
R25	RESISTOR, FIXED, COMPOSITION, 1K, 1/2W, 5%	RC20GF102J	81349	1
R26	RESISTOR, FIXED, COMPOSITION, 120 OHMS, 1/2W, 5%	RC20GF121J	81349	1
R27	RESISTOR, FIXED, COMPOSITION, 15 OHMS, 1/2W, 5%	RC20GF150J	81349	1
R28	RESISTOR, FIXED, COMPOSITION, 3.3K, 1/2W, 5%	RC20GF332J	81349	1
R29	RESISTOR, FIXED, COMPOSITION, 8.2K, 1/2W, 5%	RC20GF822J	81349	1
R30	SAME AS R8			
R31	RESISTOR, FIXED, COMPOSITION, 470 OHMS, 1/2W, 5%	RC20GF471J	81349	1
U1	INTEGRATED CIRCUIT	V6A7741393	13715	1
U2, U3	INTEGRATED CIRCUIT	V6E7709393	13715	1
	FM PULSE (A6)			
CR1-CR3	DIODE	1N914	81349	6
CR4	DIODE	1N753A	81349	1
CR5-CR7	SAME AS CR1			
C1	CAPACITOR, FIXED, MICA, 470 PF	DM15471J	72136	2
C2	CAPACITOR, FIXED, MICA, 20 PF	DM15200J	72136	2

TABLE 6-2. PARTS LIST (Continued)

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	FM PULSE (A6) (Continued)			
C3	CAPACITOR, FIXED, CERAMIC, 47 UF	8131-050-651-474M	72982	2
C4	CAPACITOR, FIXED, MICA, 560 PF	DM15561J	72136	1
C5-C6	CAPACITOR, FIXED, ELECTROLYTIC, 25UF, 25V	30DTE1207	56289	4
C7, C8	CAPACITOR, FIXED, CERAMIC, .001 UF	DD102	7p590	2
C9	CAPACITOR, FIXED, MICA, 150 PF	DM15151J	72136	1
C10	CAPACITOR, FIXED, CERAMIC, .02 UF	5835-000-Y5U-203Z	72982	4
C11	SAME AS C1			
C12	SAME AS C10			
C13	SAME AS C2			
C14	SAME AS C10			
C15-C16	SAME AS C5			
C18	SAME AS C3			
C19	SAME AS C10			
L1, L2	COIL, RF, 10 UH	DD100	72259	2
Q1, Q2	TRANSISTOR	MPS918	04713	4
Q3	TRANSISTOR	MPS3640	04713	1
Q4, Q5	SAME AS Q1			
R1-R3	RESISTOR, FIXED, COMPOSITION, 10K, 1/2W, 5%	RC20GF103J	81349	3
R4	RESISTOR, FIXED, COMPOSITION, 1.5K, 1/2W, 5%	RC20GF152J	81349	3
R5	SAME AS R1			
R6	RESISTOR, FIXED, COMPOSITION, 22K, 1/2W, 5%	RC20GF223J	81349	1
R7	RESISTOR, FIXED, COMPOSITION, 180 OHMS, 1/2W, 5%	RC20GF181J	81349	2
R8	RESISTOR, FIXED, COMPOSITION, 2.7K, 1/2W, 5%	RC20GF272J	81349	1
R9	RESISTOR, FIXED, COMPOSITION, 6.8K, 1/2W, 5%	RC20GF682J	81349	4
R10, R11	RESISTOR, FIXED, COMPOSITION, 10K, 1/2W, 5%	RC20GF103J	81349	2
R12	SAME AS R9			
R13	RESISTOR, FIXED, COMPOSITION, 27K, 1/2W, 5%	RC20GF273J	81349	1
R14	RESISTOR, FIXED, COMPOSITION, 12K, 1/2W, 5%	RC20GF123J	81349	1
R15	SAME AS R4			
R16	RESISTOR, FIXED, COMPOSITION, 56 OHMS, 1/2W, 5%	RC20GF560J	81349	1

TABLE 6-2. PARTS LIST (Continued)

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	FM PULSE (A6) (Continued)			
R17	RESISTOR, FIXED, COMPOSITION, 1.2K, 1/2W, 5%	RC20GF122J	81349	2
R18	RESISTOR, FIXED, COMPOSITION, 560 OHMS, 1/2W, 5%	RC20GF561J	81349	1
R19	SAME AS R17			
R20	SAME AS R9			
R21	RESISTOR, FIXED, COMPOSITION, 5.6K, 1/2W, 5%	RC20GF562J	81349	2
R22	SAME AS R7			
R23	RESISTOR, FIXED, COMPOSITION, 100 OHMS, 1/2W, 5%	RC20GF101J	81349	1
R24	RESISTOR, FIXED, COMPOSITION, 220 OHMS, 1/2W, 5%	RC20GF221J	81349	1
R25	SAME AS R9			
R26	SAME AS R21			
R27	SAME AS R4			
R28	RESISTOR, FIXED, COMPOSITION, 1K, 1/2W, 5%	RC20GF102J	81349	1
R29	RESISTOR, FIXED, COMPOSITION, 22 OHMS, 1/2W, 5%	RC20GF220J	81349	1
U1, U2	INTEGRATED CIRCUIT	V6E7709393	13715	2
	RF AMP (A7)			
CR1	DIODE	1N753A	81349	1
CR2	DIODE	1N757	81349	1
CR3	DIODE	1N759	81349	1
CR4	DIODE	5082-2811	28480	2
CR5	DIODE	1N965B	81349	1
CR6	SAME AS CR4			
C1, C2	CAPACITOR, FIXED, CERAMIC, .01 UF, 200V	K2000 MCC	91418	14
C3	CAPACITOR, FIXED, CERAMIC, .01 UF	CK103	71590	7
C4	SAME AS C13			
C5	CAPACITOR, FIXED, CERAMIC, .001 UF, 200V	K2000 MCC	91418	1
C6	SAME AS C1			
C7	SAME AS C3			
C8, C9	SAME AS C1			
C10, C11	SAME AS C3			

TABLE 6-2. PARTS LIST (Continued)

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	RF AMP (A7) (Continued)			
C12	CAPACITOR, FIXED, ELECTROLYTIC, 25 UF, 50V	30DTE13055	56289	1
C13	CAPACITOR, FIXED, CERAMIC, .1 UF	8131-100-651-104M	72982	4
C14	SAME AS C1			
C15	CAPACITOR, FIXED, MICA, 10 PF	DM-15-100J	72136	1
C16	SAME AS C3			
C17	SAME AS C1			
C18	SAME AS C36			
C19	SAME AS C3			
C20	SAME AS C1			
C21	CAPACITOR, FIXED, MICA, 470 PF	DM-15-471J	72136	1
C22	SAME AS C1			
C23	SAME AS C13			
C24	CAPACITOR, FIXED, MICA, 20 PF	DM-15-200J	72136	1
C25	SAME AS C1			
C26	SAME AS C36			
C27	SAME AS C1			
C28, C30	CAPACITOR, FIXED, ELECTROLYTIC, 25 UF, 25V	30DTE1207	56289	3
C31	CAPACITOR, FIXED, CERAMIC, .03 UF	DD303	71590	1
C32	SAME AS C3			
C33, C34	SAME AS C1			
C35	SAME AS C13			
C36	CAPACITOR, VARIABLE, 2.8 PF TO 10 PF	9312	91293	3
C37, C38	CAPACITOR, FIXED, CERAMIC, .02 UF	5835-000-Y5U-203Z	72982	2
C39	SAME AS C1			
C40	CAPACITOR, FEEDTHRU, 1500 PF	2499-003-X550-152M	72982	1
J1, J2	CONNECTOR	24JR124-1	24931	2
K1	RELAY	GB662C-12.2	11678	1
L1, L2	COIL, RF, 1 UH	DECI DUCTOR 1.0	72259	2
L3-L8	COIL, RF, 100 UH	DD100	72259	6
Q1, Q2	TRANSISTOR	A430	73445	2

TABLE 6-2. PARTS LIST (Continued)

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	RF AMP (A7) (Continued)			
Q3	TRANSISTOR	2N5179	81349	1
Q4-Q7	TRANSISTOR	2N5109	81349	6
Q8	TRANSISTOR	MPS918	04713	1
Q9, Q10	SAME AS Q4			
R1	RESISTOR, FIXED, COMPOSITION, 100 OHMS, 1/4W, 5%	RC07GF101J	81349	3
R2	RESISTOR, FIXED, COMPOSITION, 27 OHMS, 1/4W, 5%	RC07GF270J	81349	5
R3, R4	RESISTOR, FIXED, COMPOSITION, 68 OHMS, 1/4W, 5%	RC07GF680J	81349	2
R5	RESISTOR, FIXED, COMPOSITION, 91 OHMS, 1/4W, 5%	RC07GF910J	81349	1
R6	RESISTOR, FIXED, COMPOSITION, 10 OHMS, 1/4W, 5%	RC07GF100J	81349	5
R7	RESISTOR, FIXED, COMPOSITION, 330 OHMS, 1/4W, 5%	RC07GF331J	81349	1
R8	RESISTOR, FIXED, COMPOSITION, 220 OHMS, 1/2W, 5%	RC20GF221J	81349	1
R9	RESISTOR, FIXED, COMPOSITION, 2.7 OHMS, 1/4W, 5%	RC07GF2R7J	81349	2
R10	RESISTOR, FIXED, COMPOSITION, 470 OHMS, 1/4W, 5%	RC07GF471J	81349	1
R11	RESISTOR, FIXED, COMPOSITION, 150 OHMS, 1/4W, 5%	RC07GF151J	81349	1
R12	SAME AS R1			
R13	RESISTOR, FIXED, COMPOSITION, 1K, 1/4W, 5%	RC07GF102J	81349	2
R14	SAME AS R9			
R15	RESISTOR, FIXED, COMPOSITION, 180 OHMS, 1W, 5%	RC32GF181J	81349	4
R16	RESISTOR, FIXED, COMPOSITION, 100 OHMS, 1W, 5%	RC32GF101J	81349	1
R17	RESISTOR, FIXED, COMPOSITION, 33 OHMS, 1/2W, 5%	RC20GF330J	81349	3
R18	RESISTOR, FIXED, COMPOSITION, 390 OHMS, 1/4W, 5%	RC07GF391J	81349	2
R19	RESISTOR, FIXED, COMPOSITION, 27K, 1/4W, 5%	RC07GF273J	81349	1
R20	SAME AS R13			
R21	RESISTOR, FIXED, COMPOSITION, 120 OHMS, 1/2W, 5%	RC20GF121J	81349	3
R22	RESISTOR, FIXED, COMPOSITION, 100 OHMS, 1/2W, 5%	RC20GF101J	81349	3
R23	RESISTOR, FIXED, COMPOSITION, 330 OHMS, 1W, 5%	RC32GF331J	81349	1
R24	RESISTOR, FIXED, COMPOSITION, 150 OHMS, 1/2W, 5%	RC20GF151J	81349	1
R25	SAME AS R18			
R26	SAME AS R6			
R27	RESISTOR, FIXED, COMPOSITION, 10K, 1/4W, 5%	RC07GF102J	81349	2

TABLE 6-2. PARTS LIST (Continued)

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	RF AMP (A7) (Continued)			
R28	SAME AS R2			
R29	SAME AS R15			
R30	RESISTOR, FIXED, COMPOSITION, 10 OHMS, 1/2W, 5%	RC20GF100J	81349	3
R31	SAME AS R15			
R32	SAME AS R17			
R33	RESISTOR, FIXED, COMPOSITION, 100K, 1/4W, 5%	RC07GF104J	81349	1
R34	RESISTOR, FIXED, COMPOSITION, 1.5K, 1/4W, 5%	RC07GF152J	81349	1
R35	SAME AS R6			
R36	RESISTOR, FIXED, COMPOSITION, 330 OHMS, 2W, 5%	RC42GF331J	81349	1
R37	SAME AS R21			
R38, R39	RESISTOR, VARIABLE, 10K, 30%	U201R103B	71450	2
R40	RESISTOR, FIXED, COMPOSITION, 51 OHMS, 1W, 5%	RC32GF510J	81349	1
R41	SAME AS R6			
R42	RESISTOR, FIXED, COMPOSITION, 2.2K, 1/4W, 5%	RC07GF222J	81349	1
R43	SAME AS R27			
R44	SAME AS R30			
R45	SAME AS R15			
R46	SAME AS R1			
R47	RESISTOR, FIXED, COMPOSITION, 4.7K, 1/4W, 5%	RC07GF472J	81349	2
R48	RESISTOR, VARIABLE, 100 OHMS, 30%	U201-101	71450	2
R49	SAME AS R17			
R50	SAME AS R22			
R51	RESISTOR, FIXED, COMPOSITION, 150 OHMS, 2W, 5%	RC42GF151J	81349	1
R52	SAME AS R21			
R53	RESISTOR, FIXED, COMPOSITION, 39 OHMS, 1/4W, 5%	RC07GF390J	81349	1
R54, R55	RESISTOR, FIXED, FILM, 10K, 1/8W, 1%	RN5501002F	81349	2
R56	SAME AS R30			
R57	SAME AS R6			
R58	SAME AS R2			
R59	RESISTOR, FIXED, COMPOSITION, 120 OHMS, 2W, 5%	RC42GF121J	81349	1

TABLE 6-2. PARTS LIST (Continued)

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	RF AMP (A7) (Continued)			
R60	SAME AS R22			
R61	SAME AS R48			
R62, R63	NOT USED			
R64	SAME AS R47			
R65	SELECT IN TEST			
R66	SAME AS R2			
R67	SAME AS R2			
U1	INTEGRATED CIRCUIT	V6E7709393	13715	1
U2	INTEGRATED CIRCUIT	V6A7741393	13715	1
	MOD MIXER (A8)			
CR1, CR2	DIODE	5082-3039	28480	2
CR3, CR4	DIODE	5082-3080	28480	2
C1	NOT USED			
C2	CAPACITOR, FIXED, 8.2 PF	SF61088.2	95121	3
C3	CAPACITOR, FIXED, 2.2 PF	SF6108 2.2	95121	4
C4	SAME AS C2			
C5	SAME AS C3			
C6	SAME AS C2			
C7, C8	CAPACITOR, VARIABLE, 2.8-10 PF	9312	91293	2
C9, C10	SAME AS C3			
J1-J4	CONNECTOR	24JR124-1	24931	4
L1, L2	COIL, RF, .1 UH	WEEDUCTOR-1	72259	2
L3	COIL, RF	100648	33013	1
L4	COIL, RF	100649	33013	1
L5	COIL, RF	100650	33013	1
L6	SAME AS L4			
L7	SAME AS L3			
R1	RESISTOR, FIXED, COMPOSITION, 270 OHMS, 1/4W, 5%	RC07GF271J	81349	3
R2	RESISTOR, FIXED, COMPOSITION, 15 OHMS, 1/4W, 5%	RC07GF150J	81349	3

TABLE 6-2. PARTS LIST (Continued)

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	MOD MIXER (A8) (Continued)			
R3	RESISTOR, FIXED, COMPOSITION, 22 OHMS, 1/4W, 5%	RC07GF220J	81349	1
R4	RESISTOR, FIXED, COMPOSITION, 270 OHMS, 1/2W, 5%	RC20GF271J	81349	1
R5	RESISTOR, FIXED, COMPOSITION, 4.7 OHMS, 1/4W, 5%	RC07GF4R7J	81349	5
R6	RESISTOR, FIXED, COMPOSITION, 47 OHMS, 1/4W, 5%	RC07GF470J	81349	1
R7	RESISTOR, FIXED, COMPOSITION, 27 OHMS, 1/4W, 5%	RC07GF270J	81349	2
R8	RESISTOR, FIXED, COMPOSITION, 30 OHMS, 1/4W, 5%	RC07GF300J	81349	1
R9, R11	RESISTOR, FIXED, COMPOSITION, 100 OHMS, 1/4W, 5%	RC07GF101J	81349	4
R12	RESISTOR, FIXED, COMPOSITION, 330 OHMS, 1/2W, 5%	RC20GF331J	81349	1
R13	RESISTOR, FIXED, COMPOSITION, 36 OHMS, 1/4W, 5%	RC07GF360J	81349	1
R14	SAME AS R2			
R15	SAME AS R9			
R16	RESISTOR, FIXED, COMPOSITION, 56 OHMS, 1/4W, 5%	RC07GF560J	81349	1
R17	SAME AS R5			
R18	SAME AS R1			
R19-R21	SAME AS R5			
R22	SAME AS R1			
R23	RESISTOR, FIXED, COMPOSITION, 8.2 OHMS, 1/4W, 5%	RC07GF8R2J	81349	1
R24	SAME AS R7			
R25	RESISTOR, FIXED, COMPOSITION, 150 OHMS, 1/4W, 5%	RC07GF151J	81349	1
R26	SAME AS R2			
U1	MIXER	100505	33013	1
U2	MIXER	100594	33013	1
	LOW PASS FILTER (A9)			
C1-C6	CAPACITOR, VARIABLE, 2.8-10 PF	9312	91293	6
L1	COIL, RF	100625	33013	1
J1, J2	CONNECTOR	24JR124-1	24931	2

TABLE 6-2. PARTS LIST (Continued)

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	POWER SUPPLY BOARD ASSY (A10)			
CR1-CR10	DIODE	1N4002	81349	10
CR11	DIODE, ZENER	1N753	81349	1
CR12	DIODE	1N914	81349	1
C1	CAPACITOR, 1700 UF, 25V	39D178G025HL4	56289	1
C2	CAPACITOR, 3800 UF, 15V	39D388G015HP4	56289	1
C3, C6	CAPACITOR, 200 UF, 25V	30D207G025DH4	56289	2
C4, C5	CAPACITOR, 700 UF, 75V	39D707G075HP4	56289	2
C7	CAPACITOR, .47 UF, 50V	8131-050-651-474M	72982	1
C8	CAPACITOR, 30 UF, 75V	39D306G075EE4	56289	1
C9	CAPACITOR, .005 UF, 1 KV	CK502	71590	1
C10	CAPACITOR, 50 UF, 50V	39D506G050EE4	56289	1
C11, C13	CAPACITOR, 100 UF, 16V	30D107G016DC4	56289	2
C12	CAPACITOR, 200 UF, 12V	30D207G012DF4	56289	1
C14	CAPACITOR, 25 UF, 25V	30DTE1207	56289	1
Q1	TRANSISTOR	2N2905	81349	4
Q2-Q4	TRANSISTOR	2N2101	81349	8
Q5	SAME AS Q1			
Q6	SAME AS Q2			
Q7	SAME AS Q1			
Q8-Q11	SAME AS Q2			
Q12	SAME AS Q1			
R1	RESISTOR, FIXED, COMPOSITION, 10 OHMS, ±5%, 2W	RC42GF100J	81349	1
R2	RESISTOR, FIXED, COMPOSITION, 2.7K, ±5%, 1/2W	RC20GF272J	81349	1
R3	RESISTOR, FIXED, COMPOSITION, 1K, ±5%, 1/2W	RC20GF102J	81349	4
R4	RESISTOR, FIXED, CILM, 715 OHMS, ±1%, 1/2W	RN60D7150F	81349	1
R5	RESISTOR, FIXED, COMPOSITION, 220 OHMS, ±5%, 1/2W	RC20GF221J	81349	1
R6	RESISTOR, FIXED, COMPOSITION, .22 OHMS, ±5%, 1/2W	BWH-22	75042	1
R7, R8	RESISTOR, FIXED, COMPOSITION, 10K, ±5%, 1/2W	RC20GF103J	81349	2
R9	RESISTOR, FIXED, FILM, 1K, ±1%, 1/2W	RN60D1001F	81349	1
R10	RESISTOR, FIXED, COMPOSITION, 2.7 OHMS, ±5%, 1/2W	RC20GF2R7J	81349	1

TABLE 6-2. PARTS LIST (Continued)

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	POWER SUPPLY BOARD ASSY (A10) (Continued)			
R11	RESISTOR, FIXED, FILM, 1.82K, ±1%, 1/2W	RN60D1821F	81349	2
R12	RESISTOR, FIXED, COMPOSITION, 22K, ±5%, 1/2W	RC20GF223J	81349	1
R13-R14	SAME AS R3			
R15	RESISTOR, FIXED, COMPOSITION, .51 OHMS, ±5%, 2W	BWH-.51	75042	1
R16	RESISTOR, FIXED, COMPOSITION, .75 OHMS, ±5%, 2W	BWH-.75	75042	1
R17	SAME AS R3			
R18	RESISTOR, FIXED, COMPOSITION, 1.5 OHMS, ±5%, 1/2W	RC20GF1R5J	81349	1
R19	RESISTOR, FIXED, COMPOSITION, 2.2K, ±5%, 1/2W	RC20GF222J	81349	1
R20	RESISTOR, FIXED, FILM, 2.67K, ±1%, 1/2W	RN60D2671F	81349	1
R21, R22	RESISTOR, FIXED, FILM, 15K, ±1%, 1/2W	RN60D1502F	81349	2
R23	RESISTOR, FIXED, COMPOSITION, 3.3K, ±5%, 1/2W	RC20GF332J	81349	2
R24	RESISTOR, VARIABLE, 5K, ±30%	U201-5K	71450	1
R25	RESISTOR, FIXED, COMPOSITION, 4.7K, ±5%, 1/2W	RC20GF472J	81349	1
R26	RESISTOR, FIXED, COMPOSITION, 5.11K, ±1%, 1/2W	RN60D5111F	81349	1
R27	SAME AS R23			
R28	SAME AS R11			
R29	RESISTOR, FIXED, FILM, 2K, ±1%, 1/2W	RN60D2001F	81349	1
U1	INTEGRATED CIRCUIT	MA723	01295	1

TABLE 6-2. PARTS LIST (Continued)

REF SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR'S CODE	QTY
	ISOLATION AMP (A11)			
C1	CAPACITOR, FIXED, 1 PF	SF61081	95121	1
C2, C3	CAPACITOR, FIXED, 2.2 PF	SF61082.2	95121	3
C4-C6	CAPACITOR, VARIABLE, 2.8-10 PF	9312	91293	3
C7	SAME AS C2			
C8	CAPACITOR, FIXED, CERAMIC, .01 UF	K2000 MLC	91418	1
C9	CAPACITOR, FEEDTHRU, 1500 PF	2499-003-X550-152M	72982	1
J1, J2	CONNECTOR	24JR124-1	24931	2
L1	COIL, RF	100627	33013	1
L2	COIL, RF	100657	33013	1
L3-L4	COIL, RF, .1 UH	WEEDUCTOR	72259	2
R1	RESISTOR, FIXED, COMPOSITION, 27 OHMS, 1/4W, 5%	RC07GF270J	81349	1
R2, R3	RESISTOR, FIXED, COMPOSITION, 120 OHMS, 1/4W, 5%	RC07GF121J	81349	2
R4, R5	RESISTOR, FIXED, COMPOSITION, 10 OHMS, 1/4W, 5%	RC07GF100J	81349	2
R6	RESISTOR, FIXED, COMPOSITION, 62 OHMS, 1/4W, 5%	RC07GF620J	81349	1
R7	RESISTOR, FIXED, COMPOSITION, 560 OHMS, 1/2W, 5%	RC20GF561J	81349	1
R8	RESISTOR, FIXED, COMPOSITION, 56 OHMS, 1/4W, 5%	RC07GF560J	81349	1
R9	RESISTOR, FIXED, COMPOSITION, 22 OHMS, 1/4W, 5%	RC07GF220J	81349	1
Q1	TRANSISTOR	2N5109	81349	1

MP MASTER
MA30869